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The influence of intention, outcome and question-wording on children's and adults'

moral judgments

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1        **Abstract**

2        The influence of intention and outcome information on moral judgments was investigated

3        by telling children aged 4-8 years and adults (*N*=169) stories involving accidental harms

4        (positive intention, negative outcome) or attempted harms (negative intention, positive

5        outcome) from two studies (Helwig, Zelazo, & Wilson, 2001; Zelazo, Helwig, & Lau, 1996).

6        When the original acceptability (wrongness) question was asked, the original findings were

7        closely replicated: children's and adults' acceptability judgments, and children's punishment

8        judgments, were primarily outcome-based. However, when this question was rephrased, 4-5-

9        year-olds' judgments were approximately equally influenced by intention and outcome, and

10        from 5-6 years they were primarily intention-based. These findings indicate that, for

11        methodological reasons, children's (and adults') ability to make intention-based judgment has

12        often been substantially underestimated.

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14        Key words: Moral development; moral judgment; intention; outcome; replication;

15        acceptability; punishment

1	The influence of intention, outcome and question-wording on children's and adults'

2	moral judgments

3	**1. Introduction**

4	Piaget (1932/1965) investigated whether children's moral judgments are based on

5	intention or outcome by asking them about pairs of stories. In one of each pair a well-

6	intentioned action accidentally resulted in a bad outcome, and in the other an ill-intentioned

7	action led to a better outcome. He found that most children below about 10 years of age judged

8	the well-intentioned agent to be the naughtier; in contrast to adults' intention-based evaluations,

9	children judged actions and agents according to consequence.

10	Although subsequent research has established that children's moral judgments are not

11	*exclusively* outcome-based, and that children are often aware of and sensitive to agents'

12	intentions, many researchers have supported the claim that young children's moral judgments

13	are *primarily* outcome-based (e.g., Buchanan & Thompson, 1973; Cushman, Sheketoff,

14	Wharton, & Carey, 2013; Elkind & Dabek, 1977; Farnill, 1974; Gummerum & Chu, 2014;

15	Helwig, Zelazo, & Wilson, 2001; Imamoğlu, 1975; Killen, Mulvey, Richardson, Jampol, &

16	Woodward, 2011; Margoni & Surian, 2016; Walden, 1982; Yuill, 1984; Zelazo, Helwig, &

17	Lau, 1996). However, others have reported that even young children' moral judgments can be

18	strongly influenced by intentions (e.g., Baird & Astington, 2004; Bearison & Isaacs, 1975;

19	Chandler, Greenspan, & Barenboim, 1973; Gvozdic, Moutier, Dupoux & Buon, 2016; Leon,

20	1982; Nelson, 1980; Nobes, Panagiotaki, & Pawson, 2009; Nummedal & Bass, 1976; Vaish,

21	Carpenter, & Tomasello, 2010). Hamlin (2013) has recently reported that 8-month-olds prefer

22	well-intentioned to successful agents (toys); that is, like adults, they prioritize intention over

23	outcome. Hamlin suggests that her "results are inconsistent with past research suggesting that

24	young children focus mainly on outcomes (e.g., Piaget, 1932/1965), and support the possibility

25	that young children fail to privilege intention in their social and moral judgments […] due to

26	methodological difficulties, not psychological ones." (p. 460). This echoes Keasey's (1978)

1    view that: "the absence of intentionality [could be] merely an artefact of some feature of the

2    assessment paradigm" (p. 237).

3        Despite the fundamental importance of intention-based moral judgment – Gray, Young

4    and Waytz (2012) describe our sensitivity to others' intentions and experiences as the very

5    essence of human morality – there remains considerable disagreement between researchers

6    about its development, and substantial discrepancies in findings. After decades of research, and

7    scores of studies, it is still unclear whether the claim that children's moral judgment is primarily

8    outcome-based is correct. The key issue now facing researchers is not so much to establish

9    whether evidence can be found to support either "side" (or, more accurately, the various sides)

10   of the debate – each can already refer to a large body of research – as to determine the reasons

11   why researchers report such contrasting findings. Only when this is done will we have a clearer

12   idea of their relative validity. Unfortunately, there has been little if any attempt to resolve in

13   this direct way the long and continuing debate about the development of intention-based moral

14   judgment.

15       Duncan, Engel, Claessens, and Dowsett (2014) report that, despite replication being a

16   key component of the scientific method, it is often overlooked in the developmental literature.

17   They argue that replicability and robustness should be assessed by comparing results from

18   studies conducted by independent researchers, using different methods, across varying

19   populations, and at different times. In this study we took this approach to examine the reasons

20   for the findings of two of the most frequently-cited studies in this area (Helwig et al., 2001;

21   Zelazo et al., 1996). Both provide strong evidence for the prevailing view that children's moral

22   judgments are primarily outcome-based (see for example, Cushman, 2008; Killen et al., 2011;

23   Smetana, Jambon, & Ball, 2014; Young & Saxe, 2008). Yet the robustness of their findings

24   has rarely, if ever, been questioned, neither have these studies been replicated, nor alternative

25   explanations of their findings investigated. We sought to address these issues by conducting

26   replications 15-20 years after the original studies, in a different country, and examining the

effects of making one change to the methods. If it were found that their findings could not be replicated, or that the methodological change resulted in children's judgments becoming primarily intention-based, then the prevailing view would receive a substantial challenge.

**1.2 The Helwig et al. (2001) and Zelazo et al. (1996) studies**

Helwig et al. and Zelazo et al. explored children's and adults' evaluations of actions in which the valence – positive or negative – of intentions and consequences was varied systematically. In Helwig et al. the outcomes were psychological: for example, a boy wanted to make his friend happy by giving him a puppy, but accidentally gave him a tarantula, which scared him (accidental harm); another boy wanted to give a tarantula, but accidentally gave a puppy (attempted harm). In Zelazo et al. the consequences were physical: for example, a girl wanted to stroke a pet animal but accidentally hit it (accidental harm); another girl wanted to hit a pet animal but stroked it by mistake (attempted harm). After each story participants were asked an "act acceptability" (wrongness) question such as "Is it okay for Kevin to give Rob a puppy?" and a "punishment" question, such as "Should Kevin get in trouble?"

Helwig et al. and Zelazo et al. also sought to address the separate issue of whether children and adults judge according to acts (e.g., petting, hitting) or the harm that resulted from these acts. They did this by comparing responses in a "normal" condition (e.g., hitting causes pain) with responses in a "non-canonical" condition, in which, for example, a boy was scared when he received a puppy, and a pet was happy when it was hit. Their acceptability questions were also worded with this issue in mind (see 1.3 below).

Helwig et al. reported that 68.7% of 3-7 year olds, and Zelazo et al. that 80.7% of 3-5 year-olds, based their acceptability judgments solely on outcome[1]. No children in either study based their acceptability judgments on intention alone. Similarly, according to Helwig et al., when intention was positive and outcome negative (accidental harm), children's mean

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[1] These and the following figures refer to the normal condition in both studies, and to Helwig et al.'s "animal" scenario. Figures for the non-canonical condition and "clothing" scenario are similar.

1    acceptability ratings were 1.79 (i.e., *bad*) on a 1-5 scale, and when intention was negative and

2    outcome positive (attempted harm), 4.64 (approaching *really, really good*), indicating that

3    these judgments were influenced much more by outcome than by intention. The equivalent

4    mean ratings in Zelazo et al. are very similar. Intriguingly, adults also showed a strong tendency

5    to make outcome-based acceptability judgments: 92% (Helwig et al.) and 75% (Zelazo et al.)

6    used only outcome information, and none based their judgments on intention alone. And, like

7    the children, adults also considered accidental harms much worse than attempted harms (1.75

8    vs. 4.83 in Helwig et al.)

9           Regarding punishment judgments, Helwig et al. and Zelazo et al. respectively reported

10    that children rated accidental harms more punishable (0.71 and approximately 0.58, where 1 is

11    'a little' punishment) than attempted harms (0.19 and approximately 0.28, where 0 is no

12    punishment), which again indicates greater influence of outcome than of intention. However,

13    some children in Zelazo et al. took intention into account: actions with negative intentions and

14    negative outcomes were rated more punishable than actions with positive intentions and

15    negative outcomes (approximately 1.30 vs. 0.58), and actions with positive intentions and

16    positive outcomes were rated less punishable than actions with negative intentions and positive

17    outcomes (approximately 0.04 vs. 0.28). Moreover, six of Zelazo et al.'s 33 children based

18    their punishment judgments entirely on intention, eight only on outcome, and nine on both

19    intention and outcome (the other children were not consistently influenced by either intention

20    or outcome). In contrast, punishment judgments by children in Helwig et al. showed little or

21    no sign of being influenced by intention: actions with negative outcomes were rated almost as

22    punishable when the intention was positive as when it was negative (0.71 vs. 0.80), and actions

23    with positive outcomes were rated only slightly more punishable when the intention was

24    negative as when it was positive (0.19 vs. 0.16). Only one of the 33 children in Helwig et al.

25    made punishment judgments solely according to intention, compared with 12 solely according

26    to outcome, and four who based their punishment judgments on both intention and outcome.

1    All the adults in both studies based their punishment judgments either solely on intention

2    or on both intention and outcome. While none in either study thought that accidental harms

3    should be punished, the influence of outcome on adults' punishment judgments was also

4    evident from their rating actions with negative intentions considerably more punishable if the

5    outcome was negative than when it was positive (1.75 vs. 0.92 in Helwig et al.; approximately

6    1.85 vs. 0.35 in Zelazo et al.)

7    In sum, according to both studies children's and adults' acceptability judgments were

8    almost exclusively outcome-based; children's punishment judgments were also based

9    considerably more on outcome than on intention in Helwig et al., and somewhat more on

10   outcome than intention in Zelazo et al.; and adults in both studies judged punishment primarily

11   – but by no means solely - according to intention.

12   While these findings indicate that children's judgments are not *exclusively* outcome-

13   based, they are consistent with the view that children's judgments are *primarily* outcome-based

14   since they indicate that, at least until 7 years of age, children tend to base their acceptability

15   and punishment judgments considerably more on outcome than on intention. They also show

16   an outcome-to-intention shift in punishment judgments, since adults assessed the punishability

17   of actions primarily (though not exclusively) according to intention. Much more surprising is

18   that these two studies also suggest that, even by adulthood, there is no outcome-to-intention

19   shift in acceptability judgments.

20   One advantage of including adults in samples is that it enables developmental researchers

21   to establish the "mature" response against which children at various stages can be compared.

22   As Coley (2000) argues, "To characterize the process of conceptual development, we need to

23   understand the adult model, the modal 'endstate' of development in a given society" (p. 82).

24   Another advantage of testing adults with children's tasks is that it allows us to validate

25   methods: if even adults fail to give the "right" answer, the test is not measuring what it should

26   do. For example, if adults fail a children's task because they find it confusing or ambiguous, it

1    is very likely that young children will do so, too (see Nobes & Panagiotaki, 2007; 2009 for

2    analyses of why adults failed a test of scientific understanding designed for 5-year-olds).

3    Perhaps the reason why Helwig et al.'s and Zelazo et al.'s adult participants made outcome-

4    based acceptability judgments was methodological: something – or some things – about the

5    vignettes or questions led adults to appear to be outcome-focused moral judges. And if this

6    were the case, it is likely that these methodological factors also influenced the children's

7    responses, which would lead to their relative use of intention and outcome information in moral

8    judgments being misrepresented. One possible methodological reason for Helwig et al.'s and

9    Zelazo et al.'s findings is the wording of the acceptability question.

10    **1.3 The acceptability questions**

11    Helwig et al. and Zelazo et al. sought to investigate not only the influence of intentions

12    and outcomes on moral judgments (the focus of this study), but also whether children and adults

13    judge according to the nature of the acts (e.g., hitting or petting) or to the harm that results from

14    these acts. For this reason, they asked acceptability questions that could be answered in

15    response to any of these four factors.

16    When told about a girl who wanted to pet an animal (a "dax"), but accidentally hurt it, a

17    mature, intention-based moral judge would be expected to say that she was good, regardless of

18    the outcome. However, in response to the acceptability question asked by Zelazo et al. – "Is it

19    okay for her to hit the dax?" – the same judge might say "No, it's not okay" because it is,

20    indeed, bad to hit it. In answer to the next question – "How bad is it to hit the dax?" – it would

21    seem reasonable to reply "Very bad". Similarly, when Helwig et al. told participants about a

22    boy who intended to give his friend a scary tarantula but accidentally gave him a puppy, they

23    asked "Is it okay for Kevin to give Rob a puppy?" Here, it seems appropriate to answer "Yes,

24    it is okay". In both cases, the acceptability question could be interpreted by participants as

25    being about the outcome of the action rather than about the agent or the reasons for the action,

26    in particular the agent's intention. As a result of this perceived outcome-focus, some

1  participants might have interpreted Helwig et al.'s and Zelazo et al.'s acceptability questions

2  as asking them to evaluate only the outcome of actions, regardless of the agents' intentions. If

3  so, these participants were not making moral judgments of the agents because such judgments

4  must take intentions, not solely outcomes, into account. This might explain some, or even all,

5  of the high proportions of outcome-based acceptability judgments reported by both studies.

6      **1.4 The punishment questions**

7      In contrast to the acceptability questions, the punishment questions in Helwig et al. and

8  Zelazo et al. – e.g., "Should Sally get in trouble?" – are about the agent, not the outcome.

9  However, for several reasons the punishment questions might also have led Helwig et al. and

10  Zelazo et al. to overestimate participants' use of outcome information in moral judgments.

11      First, punishment questions were asked directly after the acceptability questions. This

12  means that, when asked about punishment, there might have been a priming or recency effect

13  from the acceptability question that led participants to focus on the outcome. Outcome recency

14  (Feldman, Klosson, Parsons, Rholes, & Ruble, 1976; Nummedal & Bass, 1976) and increased

15  salience of outcome relative to intention (Bearison & Isaacs, 1973; Nelson, 1980) have been

16  shown to lead children to make more outcome-based moral judgments.

17      A second reason why children's punishment judgments were based largely on outcome

18  in Helwig et al.'s study could be that the punishment question was asked only when

19  acceptability was judged to be quite bad or very bad. As a result, an intention-focused moral

20  judge who – perhaps because of the wording of the acceptability question – made an apparently

21  outcome-based acceptability judgment of an attempted harm (i.e., good), would also be

22  recorded as giving an apparently outcome-based punishment judgment (i.e., no punishment).

23      Another possible problem with the punishment questions is that some participants might

24  assume that punishing authorities (e.g., parents) could not read the agents' minds and therefore

25  could not know their good or bad intentions. Since in reality intention and outcome are usually

26  congruent (bad outcomes tend to result from bad intentions, and vice versa), it is likely that

1   some participants interpreted the question in terms of what punishers should do, assuming that

2   they knew only about the outcome. Such responses might reflect children's actual experiences

3   of being punished even when they didn't mean to do something wrong, perhaps because their

4   parents were unaware of, or didn't believe, the child's actual intentions. That is, some

5   participants' answers to the punishment questions might not have been moral judgments at all,

6   but instead predictions of how parents would respond on discovering the outcome of an

7   accident.

8   **1.5 The current study**

9   In this study we investigated the development of intention-based moral judgment by

10  addressing the neglected issue of why researchers have reported such discrepant results. Our

11  approach was innovative in two main ways: first, for the first time in this area, replications of

12  previous studies other than Piaget's were conducted; and second, the methods of these previous

13  studies – specifically, the phrasing of the acceptability questions – were manipulated to

14  determine their influence on moral judgments. Helwig et al.'s and Zelazo et al.'s studies were

15  replicated because they provided strong support for the view that children's moral judgments

16  are primarily outcome-based. This approach ensured that any findings that differed from theirs

17  – particularly of intention-based judgment – could only be accounted for by this manipulation.

18  Three experimental changes from Helwig et al.'s and Zelazo et al.'s methods were made

19  (Appendix). First, as well as being asked the original  acceptability question (e.g., "Is it okay

20  for Anne to stroke the dax?") about two stories, each participant answered an agent-focused

21  acceptability question (e.g., "Is Anne good, bad or just okay?") about two others. This

22  rephrased question is not a revolutionary change: on the contrary, it is similar to those used in

23  most other studies in this area. For example, Cushman et al. (2013) asked "Is Claire a bad,

24  naughty girl?" Nelson (1980) asked whether the boy was "good or bad, or just okay", and

25  Piaget (1932/1965) asked which of the children in each story pair was naughtier. In fact, Helwig

26  et al.'s and Zelazo et al.'s acceptability questions marked a departure from the approach taken

by almost all previous researchers in this area, who have investigated judgments of agents and their actions, rather than judgments of the outcomes of those actions. Helwig et al. and Zelazo et al. introduced this form of question (and the noncanonical condition) to address the separate issue of whether children and adults judge according to acts (e.g., petting is always right; hitting is always wrong), or to outcomes, that is, the resulting harm (e.g., the pet feels happy or sad).

Second, when the rephrased question was used, information and questions about the agent's character (e.g., "Anne is nasty. She likes to hurt everyone… Is Anne nasty or nice?") were removed. This character information was included in the original studies presumably to enhance children's understanding of the agents' intentions, but it was excluded here because it provided the answer to the changed acceptability question. Its exclusion is likely to have reduced the salience of intention, and hence participants' understanding, recall and awareness of intention, and therefore increased children's tendency to make outcome-based judgments. And third, unlike in Helwig et al., the punishment questions (e.g., "Should Kevin get in trouble? A little trouble or a lot of trouble?") were always asked, even if the acceptability judgment was positive. This enabled us to obtain punishment judgments on all four stories from all participants, and to assess whether punishment judgments were influenced by the wording of the acceptability questions.

Two additional questions were asked after the punishment judgments. First, participants were asked to justify their judgments so that we could monitor comprehension and determine the actual reasons for judgments. For example, if a participant justified an apparently outcome-based judgment such as punishment for a well-intentioned agent by saying "Because she wanted to hurt the dax", this would indicate that the intention had been misunderstood or forgotten, and that the judgment was actually intention-based.

The second additional question was the "parental knowledge" question, for example, "If her parents found out she tried to stroke the dax, should they tell her off?" It was asked when participants made apparently outcome-based punishment judgments to assess whether these

1    judgments were based on the assumption that potential punishers did not know the agents'

2    intentions. If so, then participants who made outcome-based judgments would be expected to

3    give intention-based responses to this question.

4        The first prediction was that, with the exception of punishment ratings in the Helwig et

5    al. study, when the original acceptability questions were asked participants would make similar

6    acceptability and punishment judgments to those of the original studies. Second, the

7    participants' acceptability and punishment judgments would be more intention-based in

8    response to the rephrased, agent-focused acceptability question than to the original

9    acceptability question. Third, acceptability and punishment judgments of the same actions were

10   predicted to be associated such that outcome-based acceptability judgments would tend to be

11   followed by outcome-based punishment judgments, and intention-based acceptability

12   judgments by intention-based punishment judgments. And fourth, the parental knowledge

13   question would elicit some intention-based responses from participants who gave apparently

14   outcome-based punishment judgments.

15                                    **2. Method**

16   **2.1 Participants**

17       There were 57 children (24 girls) aged 4-5 years ($M = 61.64$; range = 53-65 months), 38

18   (18 girls) aged 5-6 years ($M = 69.26$; range = 66-74 months), 43 (22 girls) aged 7-8 years ($M$

19   $= 93.37$; range = 87-99 months) and 31 adults (25 women; $M = 28$ years; range = 18-47 years).

20   The children attended five British state schools in generally middle class urban and rural areas.

21   The adults were parents of the children, and university administrative staff and students. All

22   participants were white except for two Asian and two African-Caribbean children and four

23   Asian adults. Children were excluded in the small number of cases when parental consent was

24   not given, on teachers' advice, or when children showed signs of boredom or distraction. Eight

25   children withdrew early.

26

1      **2.2 Design and Measures**

2      Participants were each told and asked about four illustrated stories – two from Helwig et

3      al. and two from Zelazo et al. – in which intention and outcome were incongruent (accidental

4      harms, i.e., positive intention and negative outcome; and attempted harms, i.e., negative

5      intention and positive outcomes[2]. See Appendix). All participants were asked the original

6      acceptability question about two stories, and the rephrased question about the other two stories.

7      Half of the participants in each age-group were asked the original question about Helwig et

8      al.'s accidental harm and Zelazo et al.'s attempted harm, and the rephrased question about

9      Helwig et al.'s attempted harm and Zelazo et al.'s accidental harm, and the other half were

10     asked the opposite. This approach ensured that equal numbers of responses were made when

11     the original and rephrased questions were asked about all four stories, and that each participant

12     responded twice to each of the original and rephrased questions, twice about stories from each

13     of the original studies, and twice about stories of each action valence (accidental harm or

14     attempted harm). When the rephrased question was asked, information and questions about the

15     agents' characters (nasty or nice) was excluded.

16     The IVs were age-group, acceptability question (original or rephrased), action valence

17     and source of story (Helwig et al. or Zelazo et al.). The key DVs were acceptability and

18     punishment judgments. In addition, participants were asked to justify their punishment

19     judgments to ascertain whether they had understood the agents' intentions and the outcomes of

20     their actions. For example, if a participant judged that an agent who wanted to scare his friend

21     deserved no punishment because "He wanted to make his friend happy", this would indicate

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[2] The 'congruent' stories (positive intention / positive outcome, and negative intention / negative outcome) were excluded here because they confound intention and outcome; for example, a judgment that an ill-intentioned action with a bad consequence should be punished might be based on intention, outcome, or both. In addition, in the original studies these actions were scored at or near floor or ceiling (e.g., positive intention / positive outcome actions were not punished at all and almost always rated *really, really good*), and the same would have been expected here.

1   that the participant had not understood the story, and that their judgment – which would appear

2   to be outcome-based – was actually intention-based.

3          The final "parental knowledge" question was asked when apparently outcome-based

4   punishment judgments were made, and concerned whether the agents should be punished if the

5   agents' parents knew their intentions.

6          Judgments were scored on a 5-point acceptability scale (from 1 - *really, really bad*,

7   through 3 - *okay*, to 5 - *really, really good*) and a 3-point punishment scale (from 0 - *no trouble*,

8   through 1 – *a little trouble*, to 2 - *a lot of trouble*).

9          Some linguistic changes were made to improve comprehension by British participants

10  (e.g., the mean children were nasty; the puppy was stroked, not petted; and the tarantula was a

11  big spider). Helwig et al.'s animal scenario was used because the emotions involved –

12  happiness and fear – are better understood by young children than those that occur in the other,

13  clothing, scenario, namely embarrassment and pride (Banerjee, 2002). The full texts and the

14  Zelazo et al. pictures were kindly provided by the authors, but the Helwig et al. pictures are no

15  longer available so new ones, based on the texts and the Zelazo et al. pictures, were used.

16         Each story was illustrated by seven colored 20cm x 30cm sketches showing the agents

17  and their intentions (e.g., a boy with a thought bubble showing his happy friend with a puppy),

18  the victims and their likes and dislikes (e.g., another boy looking happy with a puppy, and

19  scared with a big spider), how the accident was caused (e.g., the agent being given a box by a

20  shopkeeper), and the outcome (e.g., the victim looking unhappy with a big spider).

21  **2.3 Procedure**

22         Children were interviewed individually in quiet areas of their schools. Following an

23  introduction and explanation, the child's assent to conduct the sound-recorded interview was

24  obtained. The four stories were told in random order, except that either the two Helwig et al.

25  or the two Zelazo et al. stories were read first. Adults were interviewed in quiet areas of the

26  university or their homes.

1    **2.4 Data analysis**

2    First, as in the original studies, understanding and recall of aspects of the stories such as

3    the victims' likes and dislikes were assessed from participants' responses to the confirmation

4    and prediction questions. Next, their comprehension of the key components of the stories –

5    intentions and outcomes – was evaluated by analysis of responses to the justification question.

6    The first prediction – that the original studies' findings would be replicated – was tested

7    by comparing judgment ratings reported in the original studies with those obtained here when

8    the same stories and questions were used. To ensure comparability, and to avoid the possibility

9    of age-differences between studies leading to differences in findings, age-groups for these

10   analyses were as defined in the original studies: for example, our "5 years" age-group included

11   children aged between 54 and 80 months when compared with Helwig et al.'s data, and

12   between 61 and 71 months when compared with Zelazo et al.'s. Since there were three age-

13   groups, two stories from each of two studies, and two judgment types (acceptability and

14   punishment), a total of 24 comparisons were made by conducting univariate ANOVAs based

15   on the numbers of participants, judgment means and standard deviations reported in each study.

16   In all other analyses age-groups were as defined in the Methods, i.e., 4-5 year olds were

17   aged 53-65 months, 5-6 year-olds 66-74 months, and 7-8 year-olds 87-99  months.

18   The second prediction – concerning the influence of changing the acceptability question

19   – was tested by running mixed ANOVAs in which the 5-point acceptability and 3-point

20   punishment ratings were the DVs. In each case, age-group, acceptability question type (original

21   or rephrased) and action valence (accidental harm or attempted harm) were the IVs, with

22   repeated measures on question type and action valence.

23   The third prediction concerned associations between acceptability and punishment

24   judgments of the same actions. These judgments were transformed into dichotomous variables

25   i.e., either intention- or outcome-based. For example, saying that an accidental harm is bad is

26   an outcome-based acceptability judgment, whereas saying that an attempted harm should be

1   punished is an intention-based punishment judgment. Each action was therefore judged by each

2   participant in one of four ways, referred to as *judgment pairs*, namely outcome / outcome (i.e.,

3   outcome-based acceptability judgment and outcome-based punishment judgment), outcome /

4   intention, intention / outcome, and intention / intention.

5        The fourth prediction - that participants' apparently outcome-based punishment

6   judgments would change if the agents' parents knew about their intentions – was assessed using

7   binomial tests to compare the frequencies with which the punishment question and the parental

8   knowledge question elicited intention- or outcome-based judgments.

9                                      **3. Results**

10       **3.1 Confirmation, behavioural prediction, and emotional prediction questions**

11       All of the adults gave correct responses to the 12 confirmation questions (three per story),

12  to all four behavioural prediction questions, and to both emotional prediction questions.

13  Children were asked a total of 1342 confirmation questions, to which 20 (1.5%) incorrect

14  responses were given by five children aged 4-5, three aged 5-6, and three aged 7-8 years. As

15  in the original studies, these children's responses to the subsequent test questions were

16  excluded from the analysis. Of the 527 behavioural prediction questions put to children, a total

17  of 32 (6.1%) responses were incorrect. Most (22) of these were made by 4-5-year-olds (10.1%

18  wrong). As in the original studies, emotional prediction questions were asked only in the two

19  Helwig et al. stories. These were asked 272 times, and all but five (1.8%) were answered

20  correctly.

21       **3.2 Comprehension**

22       Analysis of the justifications revealed that, despite having responded correctly to the

23  confirmation questions, 7.2% of the 4-5 year-olds' punishment judgments were based on

24  misunderstanding of the key aspects (i.e., intention or outcome) of the stories. An additional

25  16.7% could not be coded correct or incorrect because they were missing or irrelevant. The

26  equivalent percentages for 5-6 year-olds were 7.3% and 11.0%, and for 7-8 year-olds 2.1% and

1    0.6%. All of the adults understood the stories correctly. Exclusion of judgment data when

2    comprehension was incorrect or unknown did not result in any substantive changes to the

3    analyses below.

4    **3.3 Comparisons with the original studies**

5    For these comparisons only, age groups were as defined in Helwig et al. and Zelazo et

6    al. Acceptability ratings of all four stories in the original studies were compared with those in

7    the current study when the same original question was asked (Figures 1 & 2). There were no

8    significant differences except that all twelve of the 5-year-olds in the Helwig et al. study,

9    compared with 28 of the 46 in the present study, judged the attempted harm to be *really, really*

10    *good, $F(1,56) = 6.22$, $p = .02$.*
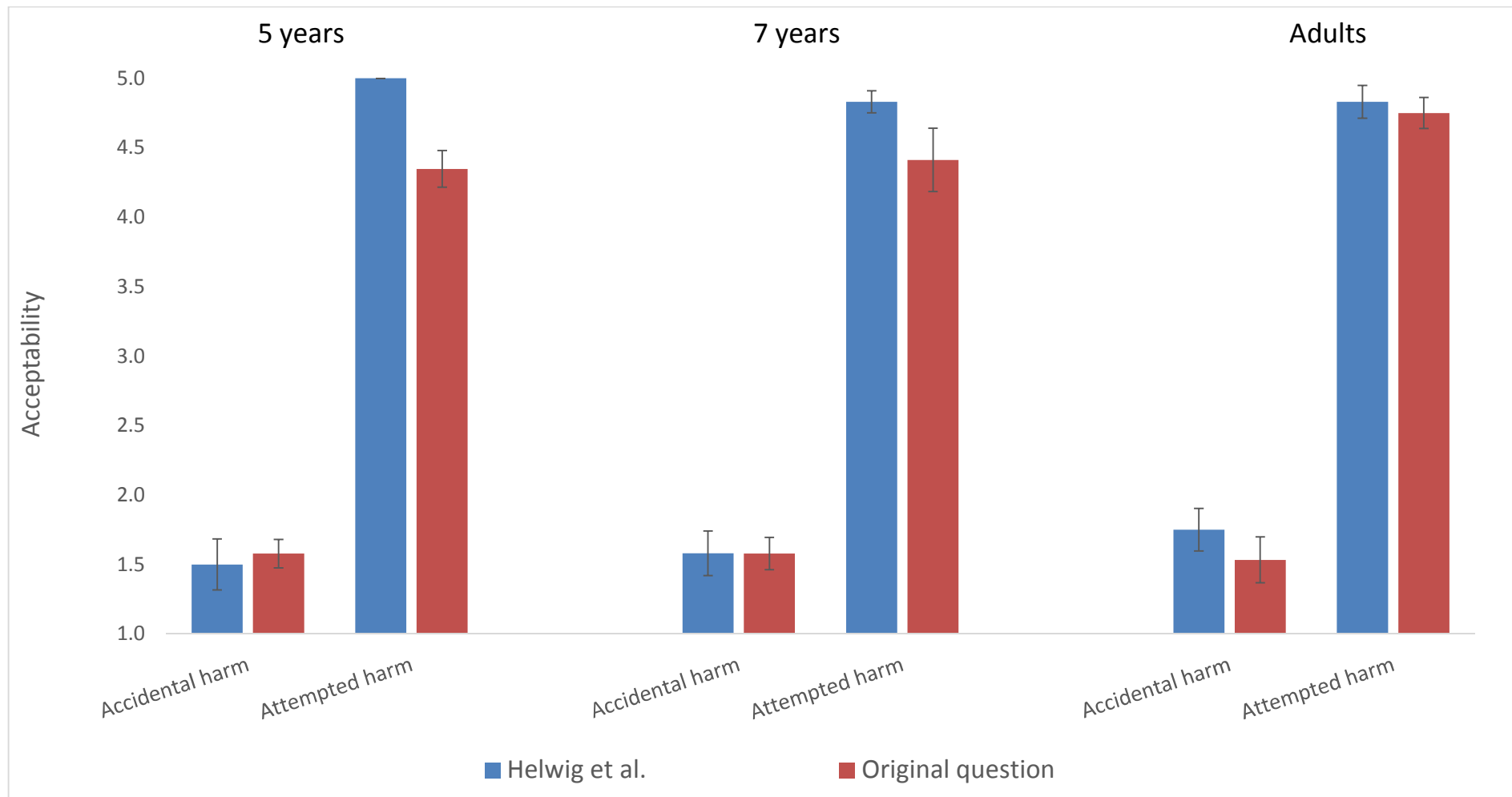
*Figure 1.* Mean (+SE) acceptability ratings (1 = really, really bad; 5 = really, really good) from Helwig et al. (2001) and the same psychological harm stories and acceptability question replicated here. (N.B. Ages are as defined in the original study: 5 years = 54-80 months; 7 years = 81-95 months)
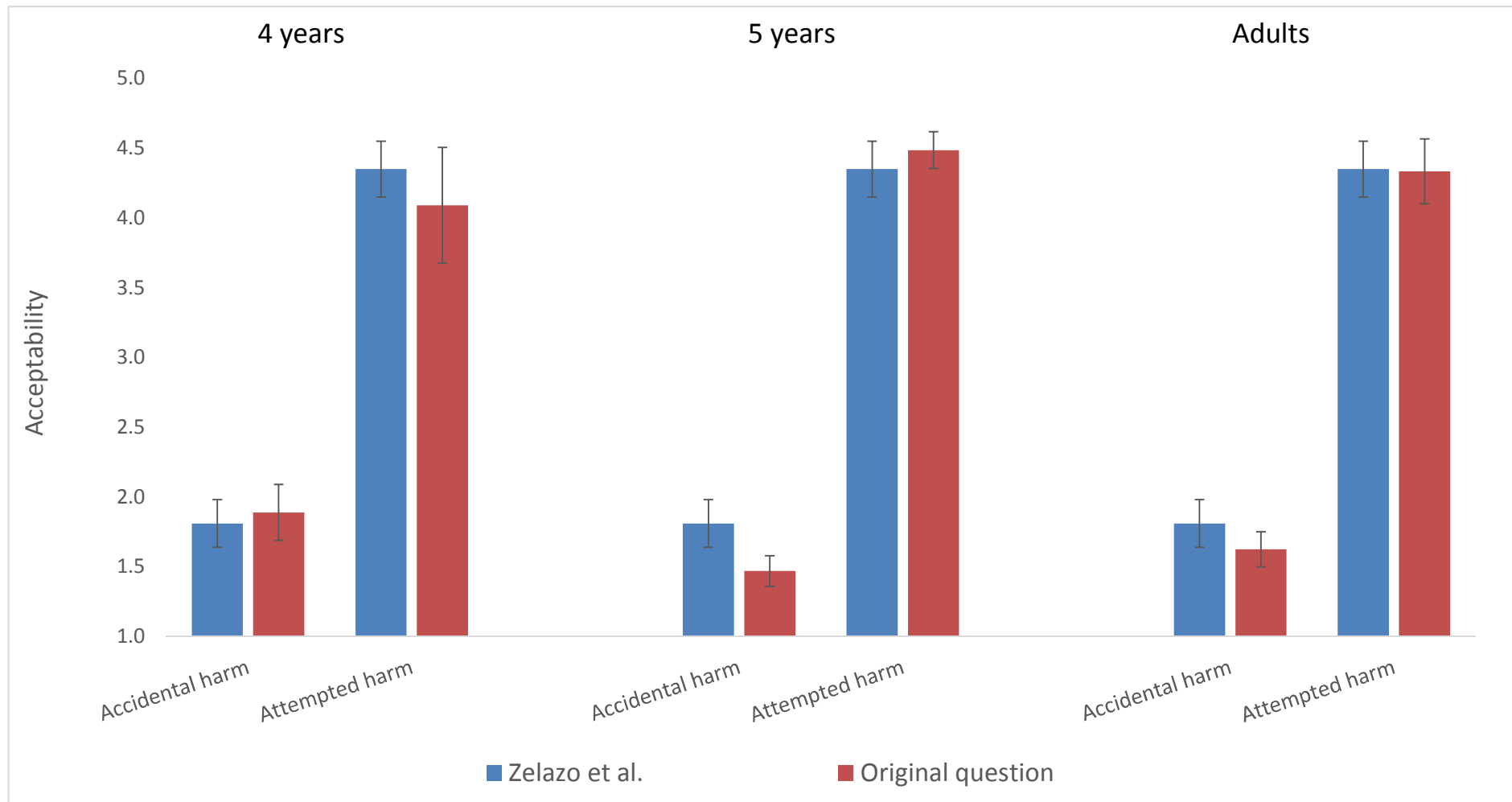
*Figure 2*. Mean (+SE) acceptability ratings (1 = really, really bad; 5 = really, really good) from Zelazo et al. (1996) and the same physical harm stories and acceptability question replicated here. (N.B. Ages are as defined in the original study: 4 years = 48-60 months; 5 years = 61-71 months.)

1    Comparison of punishment ratings when the original acceptability questions were asked

2    (Figures 3 & 4) showed that attempted harm was rated less punishable by Helwig et al.'s 5-

3    year-olds, $F(1,67) = 5.29$, $p = .03$, and 7-year-olds, $F(1,39) = 5.53$, $p = .02$, than by the children

4    in the present study. The 7-year-olds in Helwig et al. also considered the accidental harm more

5    punishable than children of the same age in the present study $F(1,42) = 5.37$, $p = .03$. In

6    contrast, there was only one marginal difference when punishment judgments of the Zelazo et

7    al. stories were compared: a surprisingly large majority of adults in Zelazo et al. thought that

8    the ill-intentioned agent should not get into trouble. This contrasts with the higher mean

9    punishment rating of the same agent in the present study, $F(1,41) = 2.80$, $p = .10$, and indeed

10   with the equivalent agent in Helwig et al., $F(1,46) = 5.92$, $p = .02$.
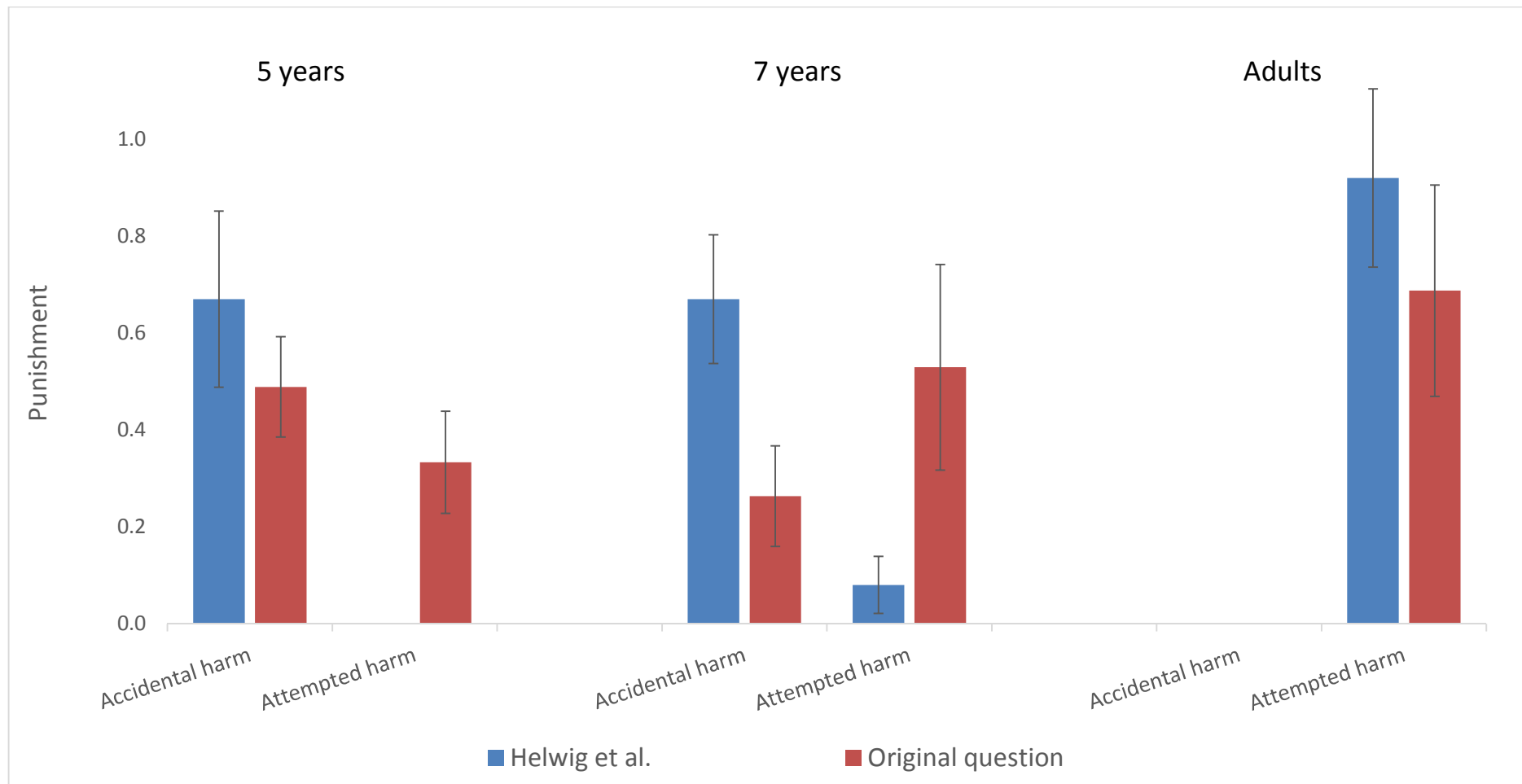
*Figure 3*. Mean (+SE) punishment ratings (0 = no trouble; 2 = a lot of trouble) from Helwig et al. (2001) and the same psychological harm stories and acceptability question replicated here. (N.B. Ages are as defined in the original study: 5 years = 54-80 months; 7 years = 81-95 months)
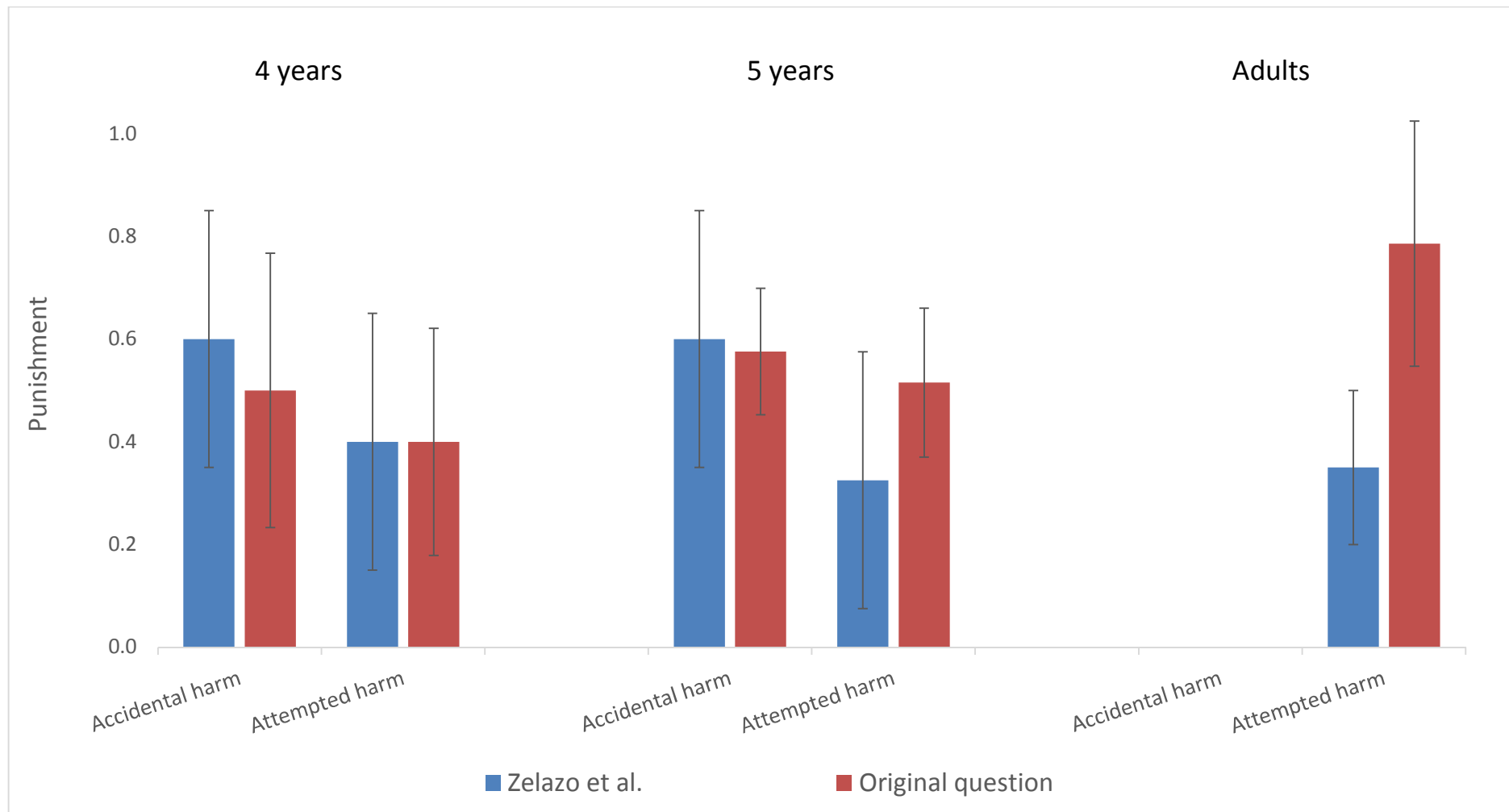
*Figure 4*. Mean (+SE) punishment ratings (0 = no trouble; 2 = a lot of trouble) from Zelazo et al. (1996) and the same physical harm stories and acceptability question replicated here. (N.B. Ages are as defined in the original study: 4 years = 48-60 months; 5 years = 61-71 months.)

1    **3.4 The influence of question wording on acceptability judgments**

2    Acceptability judgments (Figure 5) were analyzed by running a 4 (Age-group) x 2

3    (Question type [original, rephrased]) x 2 (Action valence [accidental harm, attempted harm])

4    mixed ANOVA with repeated measures on question type and action valence, and acceptability

5    ratings (from *really bad* to *really good*) as the DV.  Preliminary analyses also included story

6    source and gender, but these revealed no significant effects. There was a significant main effect

7    of action valence, $F(1,146) = 74.13$, $p < .001$, $\eta_p^2 = .34$, and a marginally significant main effect

8    of question type, $F(1, 146) = 3.25$, $p = .07$, $\eta_p^2 = .02$. These were qualified by a substantial

9    interaction between these factors, $F(1, 146) = 705.92$, $p < .001$, $\eta_p^2 = .83$: when the original

10   question was asked, almost all responses were outcome-based (i.e., accidental harms were

11   considered bad, and attempted harms good), but when the rephrased question was asked, most

12   responses were intention-based (the well-intentioned accidental harms were judged better than

13   ill-intentioned attempted harms). There was also an interaction between age-group and action

14   valence, $F(3, 146) = 10.11$, $p < .001$, $\eta_p^2 = .17$, and a 3-way-interaction between age-group,

15   action valence and question type, $F(3, 146) = 10.74$, $p < .001$, $\eta_p^2 = .18$: the older participants'

16   ratings of accidental and attempted harms were essentially reversed when the rephrased

17   questions were asked, while the younger participants' responses to the rephrased questions

18   were less polarized, so that the 4-5 year-olds rated the acceptability of accidental harms and
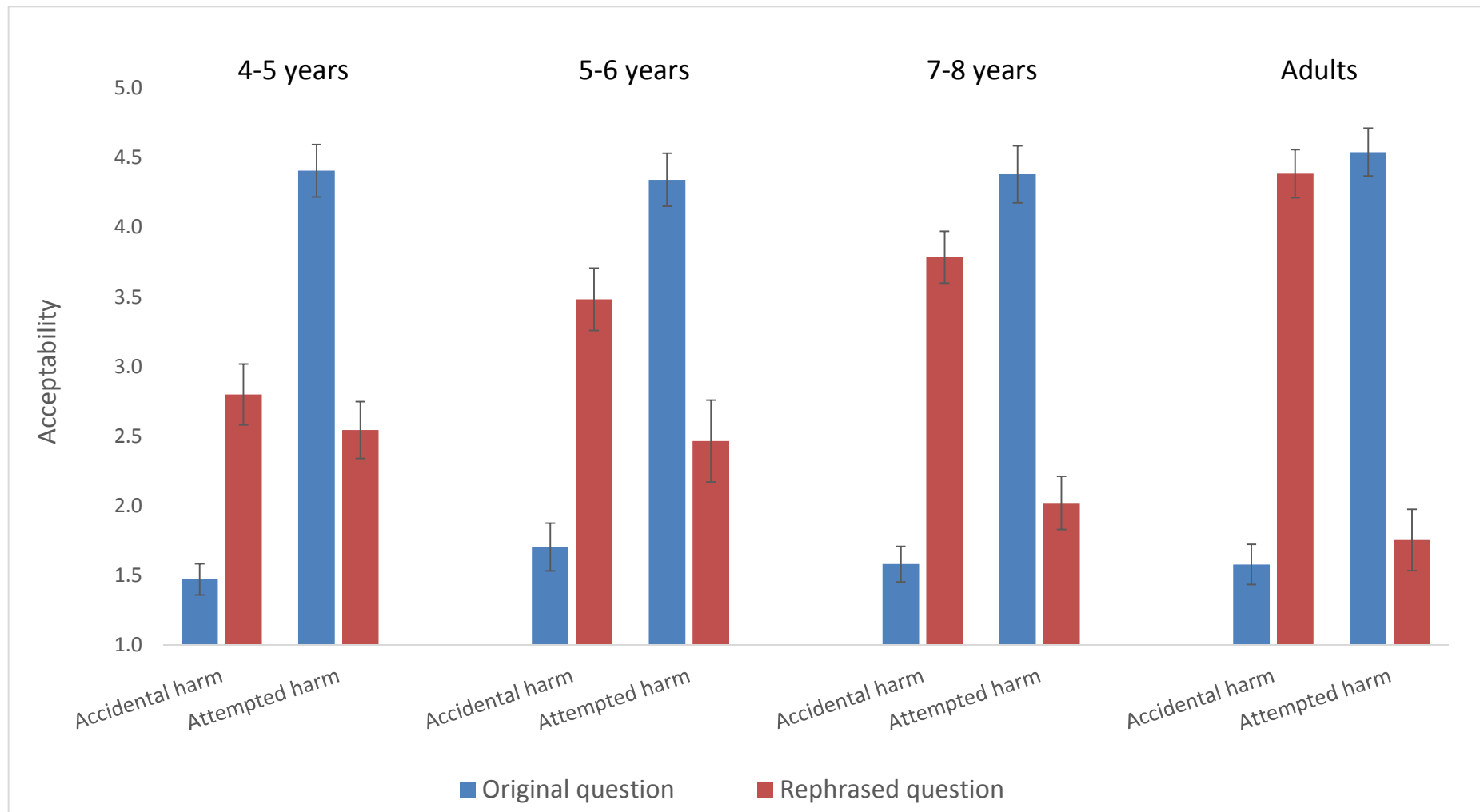
19   attempted harms approximately equally.

*Figure 5.* Mean (+SE) acceptability (1 = really, really bad; 5 = really, really good) of Helwig et al.'s (2001) and Zelazo et al.'s (1996) stories, by acceptability question type and action valence

**3.5 The influence on punishment judgments of rephrasing the acceptability question**

Punishment judgments (Figure 6) were analyzed by running the same mixed ANOVA as for acceptability above, but with punishment ratings as the DV. Story source and gender were again excluded following preliminary analyses. There was a significant main effect of action valence, $F(1, 149) = 24.56$, $p < .001$, $\eta_p^2 = .14$: participants judged ill-intentioned actions to be more punishable ($M = .64$) than well-intentioned ones ($M = .32$). There was also a marginally significant main effect of question type, $F(1, 149) = 2.93$, $p < .09$, $\eta_p^2 = .02$, and an interaction between these factors, $F(1, 149) = 7.21$, $p < .01$, $\eta_p^2 = .05$: when the original question was asked there was relatively little difference between punishment ratings of accidental harms and attempted harms ($M$s = .34 and .53); but the rephrased question elicited substantially lower punishment ratings for accidental than for attempted harms ($M$s = .30 and .75). The interaction between action valence and age-group was also significant, $F(3, 149) = 8.86$, $p < .001$, $\eta_p^2 = .15$: pairwise comparisons indicated that adults distinguished between the two action valences more clearly than all three age-groups of children ($p$s < .05), and that 7-8 year-olds did so more than 4-5 year-olds ($p < .01$).
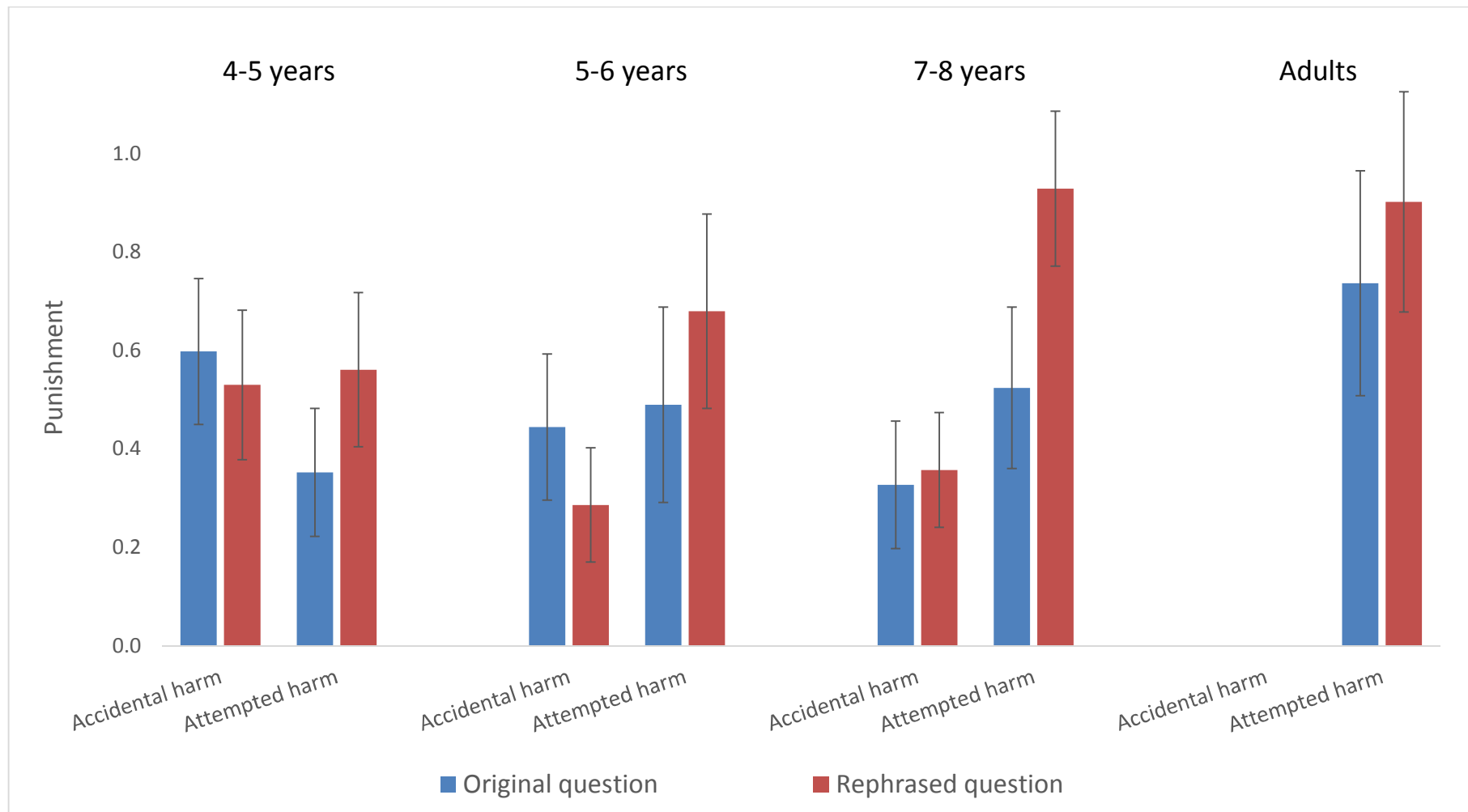
*Figure 6.* Mean (+SE) punishment ratings (0 = none; 2 = a lot) of Helwig et al.'s (2001) and Zelazo et al.'s (1996) stories, by acceptability question type and action valence.

1    **3.6 Associations between judgments elicited by the rephrased acceptability question**

2    When the rephrased acceptability question was asked, judgment bases (intention or

3    outcome) of neither acceptability nor punishment judgments were associated at any age. For

4    example, a participant who made one intention-based acceptability judgment was no more

5    likely to make a second intention-based acceptability judgment than was another participant in

6    the same age-group whose first judgment was outcome-based.

7    **3.7 Associations between acceptability and punishment judgments of the same**

8    **actions**

9    Table 1 shows the percentages of judgment pairs (i.e., acceptability and punishment

10   judgments of the same actions) when the original and rephrased acceptability questions were

11   asked. The original question elicited many more outcome-based acceptability judgments at all

12   ages than did the rephrased question, 96.3% vs. 25.7%; $\chi^2(1) = 329.39$, $p < .001$, and led to

13   more outcome-based punishment judgments, 48.2% vs. 36.4%; $\chi^2(1) = 9.14$, $p = .002$. Overall,

14   a punishment judgment was more likely to be outcome-based when the acceptability judgment

15   of the same action was also outcome-based than when the acceptability judgment was

16   intention-based, 53.9% vs. 23.7%, $\chi^2(1) = 56.73$, $p < .001$. This was particularly the case when

17   the rephrased question was asked, 72.6% vs. 23.3%, $\chi^2(1) = 64.87$, $p < .001$. When the original

18   question was asked this difference was less marked, 48.9% vs. 30.8%, and, perhaps owing to

19   the low numbers of intention-based acceptability judgments in response to this question ($n =$

20   13), non-significant, $\chi^2(1) = 1.64$, $p = .20$. When the rephrased question was asked, 72.6% of

21   outcome-based acceptability judgments were followed by outcome-based punishment

22   judgments, compared with 48.9% when the original question was asked, $\chi^2(1) = 15.03$, $p <$

23   .001.

| Judgment pair *based on* | | 4-5 years | | 5-6 years | | 7-8 years | | Adults | | All | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acceptability | Punishment | Original | Re-phrased | Original | Re-phrased | Original | Re-phrased | Original | Re-phrased | Original | Re-phrased |
| *Outcome* | *Outcome* | 54.6 | 36.3 | 55.8 | 20.4 | 43.3 | 8.4 | 26.7 | 10.4 | 45.1 | 18.8 |
| *Outcome* | *Intention* | 42.1 | 9.6 | 38.8 | 9.0 | 52.0 | 7.2 | 71.8 | 1.7 | 51.2 | 6.9 |
| *Intention* | *Outcome* | 1.2 | 8.4 | 2.2 | 26.7 | 1.2 | 21.8 | 0.0 | 8.6 | 1.1 | 16.4 |
| *Intention* | *Intention* | 2.2 | 45.7 | 3.3 | 44.1 | 3.6 | 62.7 | 1.6 | 79.3 | 2.6 | 58.0 |

1

2    *Table 1*. Percentages by age-group of judgment pairs (acceptability and punishment judgments of the same actions) based on intention and outcome

3    in response to the original and rephrased questions.

**3.8 Parental knowledge**

When participants gave a punishment judgment that indicated outcome-based reasoning they were asked whether they thought the agent should be punished if the agent's parents knew their intentions. The 4-5 year-olds were asked this question 104 times, and their punishment judgments changed to being intention-based on 75 (72.1%) of these, binomial $p < .001$. The equivalent percentages for 5-6 and 7-8 year-olds and adults were 80.0%, 86.4% and 92.9%, $p$s $< .001$. There were no differences according to whether the original or rephrased question was asked.

## 4. Discussion

Four stories from Helwig et al. (2001) and Zelazo et al. (1996) in which intention and outcome were incongruent (accidental harms, when intention is positive and outcome negative; and attempted harms, when intention is negative and outcome positive) were told to 4-8 year-olds and adults. The stories, pictures and questions were similar or identical to those of the original studies except that each participant was asked the original acceptability question (e.g., "Is it okay for Kevin to give Rob a puppy?") about two of the stories, and a rephrased acceptability question (e.g., "Is Kevin good, bad or just okay?") about the other two. After the judgments, participants were also asked to justify their responses, and to answer a "parental knowledge" question.

When replications were conducted so that the same acceptability question was asked as in the original studies, the findings were very similar. Children and adults alike judged acceptability largely or almost exclusively according to outcome: accidental harms were considered bad, while attempted harms were considered good. Similarly, regarding punishment judgments, Zelazo et al.'s results were closely replicated. (As expected, children's punishment ratings of the attempted harm in Helwig et al. were lower than in the present study owing to their excluding this question when acceptability was rated positively.) These findings indicate that, when the original question was asked, in all relevant respects the methods used here were

1  similar or identical to those of Helwig et al. and Zelazo et al. The replicability of the original

2  studies was therefore endorsed, and the first hypothesis – that when the original acceptability

3  questions were asked participants would make similar judgments to those of the original studies

4  – was supported.

5       The main innovation of this study was to introduce a different acceptability question and

6  to systematically manipulate which of the two – original or rephrased - was asked. In contrast

7  to the replicated findings, when the very same participants were asked the rephrased

8  acceptability question that – like Piaget's (1932/1965) and almost all subsequent researchers'

9  – focused on the agents, very different results were obtained. Whereas both here and in the

10  original studies the original acceptability question elicited almost exclusively outcome-based

11  acceptability judgments, when the rephrased question was asked acceptability judgments were

12  based substantially more on intention than on outcome. The older children and adults made

13  essentially the opposite acceptability judgments from when the original question was asked:

14  their acceptability judgments were now based almost exclusively on intentions. Similarly, and

15  despite the punishment question remaining unchanged, rephrasing the acceptability question

16  substantially increased the proportion of intention-based punishment judgments: from 5-6

17  years punishment judgments were considerably more intention-based than outcome-based.

18       The youngest children's judgments showed less marked, though no less significant,

19  changes. When the rephrased acceptability question was asked their acceptability and

20  punishment judgments were based approximately equally on intention and outcome. This is

21  consistent with the second hypothesis – that judgments would be more intention-based when

22  the agent-focused acceptability question was asked – and indicates that the results of the

23  original studies are not robust to the rephrasing of the acceptability question.

24       Consistent with the third prediction, there was a strong association between acceptability

25  and punishment judgments of the same actions, such that most outcome-based acceptability

26  judgments were followed by outcome-based punishment judgments, and most intention-based

1    acceptability judgments by intention-based punishment judgments. However, this association

2    was considerably stronger when the rephrased question, rather than the original question, was

3    asked. This difference might result from the rephrased acceptability question being similar to

4    the punishment question - and therefore eliciting a similar response - since both concern the

5    culpability of the agent; in contrast, the original acceptability question elicits judgments of the

6    outcome of actions which are different from, and therefore independent of, punishment

7    judgments.

8         The fourth hypothesis was also supported: when participants who made apparently

9    outcome-based punishment judgments were asked whether agents should be punished if their

10   parents knew about their intentions, the large majority gave intention-based responses. This

11   finding suggests that many apparently outcome-based judgments in the current and the original

12   studies occurred because participants assumed that the punishers could not have known the

13   agents' intentions, and therefore could judge according only to outcome. If so, then even the

14   results reported here when the agent-focused question was asked are likely to underestimate –

15   perhaps substantially – the influence of intention information on moral judgments.

16        However, these findings from the parental knowledge question should be interpreted with

17   caution. It is possible that this question elicited intention-based responses only because it

18   reminded participants, or increased the salience, of the agents' intentions. If so, for similar

19   reasons, an equivalent question that emphasized outcome might elicit outcome-based responses

20   from participants who had made intention-based judgments. Future research should avoid this

21   limitation by including counter probes to both intention- and outcome-based judgments, or by

22   telling participants before they made their judgments that the agents' parents knew about both

23   intentions and outcomes. Another possibility is that participants responded to this question

24   according to their expectations of parents (i.e., to punish when intentions are bad) rather than

25   to their own views on whether the agent should be punished[3]. However, this possibility might

---

[3] We are grateful to an anonymous reviewer for this suggestion.

1    also apply to the original punishment question (e.g., "Should Ethan get in trouble?") because

2    participants might have answered it from the point of view of whichever authority figure they

3    thought the punisher would be. This could be tested by asking instead, or as well, "How much

4    would *you* punish Ethan?" At this stage, it is only possible to conclude that responses to the

5    parental knowledge question demonstrate that even those participants who initially gave

6    outcome-based judgments were usually aware of the importance of intentions, and seemed able

7    to base their judgments of the same actions on them.

8        The finding that, within age-groups and for each type of judgment (acceptability or

9    punishment), there was no association between bases (intention or outcome) of judgments

10    means that there no evidence of there being separate groups within each age-group, one of

11    which made outcome-based judgments, the other intention-based judgments. Rather, within

12    each age-group, all participants were approximately equally likely to make intention- or

13    outcome-based judgments. This is consistent with both Piaget's (1932 / 1965) and Nelson's

14    (1980) observation that the same child can sometimes base their judgments on intention, and

15    sometimes on outcome.

16        The main implication of these findings is that, when the rephrased, agent-focused

17    acceptability question was asked, there was no evidence at any age to support the claim that

18    children's judgments are primarily outcome-based. On the contrary, from 5-6 years, children's

19    judgments were based primarily on intentions, and at 4-5 years they were based as much on

20    intentions as on outcomes. Since in all other relevant respects the methods were identical to

21    those used in the original studies and when the original question was asked here, the reason for

22    these dramatically different findings must be the rephrasing of the acceptability question. It

23    appears that the majority of participants both here and in the original studies interpreted the

24    original acceptability question to be solely about whether the outcome was good or bad, and so

25    did not take the agent's intention – and therefore culpability - into account.

1    The two different acceptability questions – Helwig et al.'s and Zelazo et al.'s that led to

2    outcome-focused judgments, and the rephrased agent-focused question used here and in most

3    other research in this area – are, then, different questions that elicit different judgments. These

4    findings therefore demonstrate the importance of distinguishing the type of dimension that is

5    being assessed in studies in this area: when assessing participants' judgments of the culpability

6    of agents, researchers should ask action- or agent-focused acceptability questions such as the

7    rephrased question used here; when assessing their judgments of the outcomes of the agents'

8    actions, researchers should use questions such as the acceptability questions asked by Helwig

9    et al. and Zelazo et al.

10    The increased influence of intention information on punishment judgments when the

11    rephrased acceptability was used is particularly intriguing because the punishment questions

12    were identical in both conditions. We suggested in the Introduction that there might be a

13    priming effect such that the original acceptability question focused participants' attention on

14    the outcomes of actions, and therefore influenced their punishment judgments as well as their

15    acceptability judgments. But it is also possible that the rephrased question focused participants'

16    attention on the agents' intentions. However, we (Nobes, Panagiotaki, & Moore, 2016) have

17    recently tested this possibility and found that, when the punishment question was asked *before*

18    the acceptability question, children's and adults' punishment judgments were *more* intention-

19    based than when the rephrased acceptability question was asked first. This indicates that

20    priming cannot explain the increased focus on intention shown by participants in their

21    punishment judgments when the rephrased acceptability question was asked; that is, any

22    priming by the rephrased question must have led to more *outcome*-based punishment

23    judgments in this study. And, since punishment judgments were considerably more outcome-

24    based when the original acceptability question was asked, the priming effect of the original

25    question in this and the original studies must have been greater than that of the rephrased

26    question. Another implication is that the findings reported here of children's and adults'

1    punishment judgments when the rephrased acceptability question was asked - despite being

2    substantially more intention-based than when the original acceptability question was asked -

3    still underestimate the extent to which children's and adults' punishment judgments are

4    intention-based.

5         The available evidence suggests that, whenever outcome-focused acceptability questions

6    are asked (e.g., Fu, Xiao, Killen, & Lee, 2014; Helwig et al., 2001; Imamoğlu, 1975; Killen et

7    al., 2011; Zelazo et al. 1996; and here), children – and even adults – give primarily outcome-

8    based judgments. However, question wording alone cannot account for all outcome-based

9    judgment. The evidence also shows that agent-focused questions do not always elicit intention-

10   based judgments, at least by young children: the 4-5 year-olds (and some older participants) in

11   this study continued to make some outcome-based judgments even when the rephrased

12   question was asked; and several previous studies used agent-focused questions and yet reported

13   mainly outcome-based judgments by young children (e.g., Cushman et al., 2013; Piaget,

14   1932/1965; Yuill, 1984). There must therefore be another factor, or other factors, that also lead

15   young children to make outcome-based judgments.

16        One possible explanation is that Piaget was partly right and that, although intention-based

17   judgments occur considerably earlier than he claimed, young children are to some extent

18   outcome-focused. Cushman and colleagues (Cushman, 2008; Cushman et al., 2013) have

19   proposed a model according to which two separate processes develop independently: young

20   children have only one, outcome-focused causal process by which they judge punishment; this

21   is gradually constrained by an intention-based process by which acceptability is evaluated. By

22   adulthood punishment judgments are based on both outcome and intention, while acceptability

23   is evaluated solely according to intention (e.g., Gino, Shu, & Bazerman, 2010; Walster, 1966;

24   Williams, 1981).

25        Cushman and colleagues' model also provides an alternative explanation of our finding

26   that, despite the punishment question remaining unchanged, punishment judgments became

1    more intention-based in line with acceptability judgments (i.e., when the acceptability question

2    was changed). These researchers propose that acceptability judgments constrain (i.e., exert an

3    influence on) subsequent punishment judgments as a result of the acceptability judgments

4    triggering the second, intention-based, process. However, this proposal is not consistent with

5    our recent finding that punishment judgments are *more* intention-based when punishment

6    questions are asked before, rather than after, the acceptability questions (Nobes et al., 2016).

7        The 2-process model might also explain why in the present study even some adults'

8    judgments were partially influenced by outcome, although there was no evidence that this

9    influence was greater for punishment judgments than for acceptability judgments. In addition,

10   the model would predict judgments of accidental harms (when the harmful outcomes trigger

11   the first, outcome-focused process) to be influenced by outcome more than are judgments of

12   attempted harms (which, lacking harmful outcomes, do not trigger the first process), but this

13   was not the case.

14       A related proposal that might also account for young children's outcome-based

15   judgments – at least of accidental harms – is that executive control resources are deployed

16   when intention information inhibits or constrains emotional responses to harmful outcomes

17   (Young, Cushman, Hauser, & Saxe, 2007). If these executive functions are compromised – for

18   example under cognitive load, or when the salience of outcomes is greater than that of

19   intentions – judgments tend to become outcome-based. Indeed, Buon, Jacob, Loissel, and

20   Dupoux (2013) report that, when engaged in a challenging task, adults' judgments became

21   outcome-based. Since their control resources are more limited than adults', this seems likely to

22   apply also to young children, especially when presented with relatively complex stories such

23   as those used by Helwig et al. and Zelazo et al. that make considerable demands on their ability

24   to remember and integrate intention and outcome information. Baird and Astington (2004) and

25   Nelson (1980) used simpler stories, and both reported that even young children made intention-

26   based judgments.

1    An alternative explanation of apparent outcome-based judgment, especially by younger

2    participants, is that they tend to assume that intentions are congruent with outcomes (Nelson,

3    1980; Sato & Wakebe, 2014). If so, especially given the greater salience and recency of

4    outcomes than of intentions in stories such as Helwig et al.'s and Zelazo et al.'s, young children

5    would be expected to misattribute positive intention to attempted harms, and negative intention

6    to accidental harms. Judgments that were actually based on (misattributed) intention would

7    therefore co-vary with outcomes and so appear to be outcome-based. This could be tested by

8    asking participants directly before and after their judgments about the agents' intentions, to

9    assess whether they had been correctly understood and remembered.

10    Another possibility is that participants might give apparently outcome-based judgments

11    of accidental harms not because of the outcomes per se, but because they consider well-

12    intentioned agents who caused accidental harm to be negligent. For example, participants might

13    have judged Helwig et al.'s well-intentioned agent to be naughty and punishable because he

14    should have checked that the puppy, not a tarantula, was inside the gift box before giving it to

15    his friend, and that Zelazo et al.'s well-intentioned agent was also blameworthy because she

16    should have held the animal more carefully to avoid its jumping up and being hit. Similarly,

17    when Cushman et al. (2013) told children about a girl who spilled paint on the floor when a

18    paint can slipped out of her hand they might have judged her to be culpable because she should

19    have held the can more carefully. And Piaget's participants might have judged John to be

20    blameworthy not because he accidentally broke fifteen cups, but because he should have been

21    more careful when opening the door which knocked them over. Because assumed negligence

22    co-varies with outcome, negligence-based judgments would appear to be outcome-based.

23    Nobes et al. (2009) found that telling participants that well-intentioned agents were careful

24    resulted in their making more intention-based judgments. (See also Nuñez, Laurent, & Gray,

25    2014, for a discussion of negligence and intentionality.)

1    Another possible reason why young children often make apparently outcome-based

2    judgments concerns their developing theory of mind. Helwig et al.'s and Zelazo et al.'s stories

3    are typical in this respect because they include the agents' desires (e.g., to hurt or make happy),

4    intentions (e.g., to hit or give a nice present), and true beliefs (e.g., that the dax likes to be

5    stroked, or that the friend likes puppies), and understanding and integrating this information is

6    likely to be challenging for young children. In addition, the Helwig et al. stories used here

7    require an understanding of false belief because each involves an agent accidentally giving the

8    wrong present (a puppy or a tarantula) as a result of a shopkeeper putting the wrong animal in

9    the gift box. Helwig et al.'s test of moral judgment is therefore also a "deceptive box" or

10   "unexpected contents" task. As in the Smarties task (Perner, Leekam & Wimmer, 1987),

11   participants know that the box actually contains one thing (pencils or, say, a tarantula) and, to

12   demonstrate a theory of mind, must show understanding that the story agent thinks it contains

13   another (Smarties or, say, a puppy). According to Perner et al., 43% of 3-year-olds responded

14   correctly to the Smarties test. Wellman and Liu (2004) report that one of 16 (6%) 3-year-olds,

15   and 14 of 21 (67%) 4-year-olds were correct on an equivalent task, and that the average age

16   when children first passed the unexpected contents false belief task was 4 years, 11 months.

17   The implication is that many of the younger children in Helwig et al.'s task would have

18   believed that the agent knew that he was giving the wrong animal (a puppy instead of a

19   tarantula, or vice versa). That is, these young children would have believed that the agent gave

20   the animal deliberately, and that the outcomes were not accidental. Whether they were actually

21   based on outcome or on incorrectly perceived intention, these young children's judgments

22   would therefore vary only with outcome, and so appear to be outcome-based.

23     It is also possible that young children are confused by other aspects of stories such as

24   those used by Helwig et al. and Zelazo et al. For example, they could have misinterpreted the

25   "thought bubbles" used to illustrate intentions in the pictures. As Yuill (1984) points out,

26   "Children may see the 'thinks' bubble pictures merely as interesting, novel depictions of action,

1    rather than as hypothetical states of affairs desired by the thinker" (p.74). If so, they would not

2    have understood the agents' intentions and therefore could not be expected to make intention-

3    based judgments.

4        This study illustrates the profound effect that a single, apparently small, methodological

5    change can have on children's and adults' responses, and the importance of conducting

6    replications (Duncan et al., 2014). It also highlights the advantages of asking for justifications

7    of judgments. It was only by asking participants why they made their judgments that it became

8    clear that the original acceptability questions were frequently interpreted as referring solely to

9    outcomes, and therefore that the agents' intentions were irrelevant. Justification questions also

10   enable monitoring of comprehension: when a young child explains that she made an apparently

11   outcome-based judgment on the grounds of an incorrectly-recalled intention, she actually made

12   an intention-based judgment.

13       A limitation of this study is that it focused on only one of the possible explanations of

14   apparent outcome-based judgment – the phrasing of the acceptability question. Although it

15   accounted for much of the outcome-based reasoning reported by Helwig et al. and Zelazo et

16   al., and is likely to explain similar findings from other studies that used the same question (e.g.,

17   Imamoğlu, 1975; Killen et al., 2011), other factors – such as those discussed above – must also

18   be involved. All require further investigation, ideally by replicating studies and systematically

19   manipulating individual factors.

20       Another limitation of this study concerns ecological validity. As in previous research in

21   this area it involved unfamiliar researchers testing children in unfamiliar contexts by asking

22   about hypothetical events. In reality, others' intentions are often ambiguous and implicit and

23   cannot easily be inferred from behaviour. In contrast, outcomes – such as happiness or distress

24   – are usually salient and unambiguous. As a result, children's judgments of actual events might

25   typically remain outcome-based long after they are capable of intention-based reasoning.

1    Related topics for future research concern the causes and consequences of mature,

2    intention-based judgment. For example, peer interactions and relationships might be influential

3    in its development, such that popular children who have frequent opportunities to discuss other

4    children's intentions, and experience their actions, develop intention-based reasoning before

5    rejected children (Coie & Dodge, 1988; Harris, 2011; Piaget 1932/1965). If rejected children

6    were found to continue to make outcome-based judgments long after other children, this might

7    play an important role in the explanation and aetiology of rejected children's tendency to

8    misattribute hostility to others' benign intentions, which in turn contributes to their aggressive

9    behavior (Arsenio, Adams, & Gold, 2009; Crick & Dodge, 1994).

10    These findings show that Helwig et al.'s and Zelazo et al.'s acceptability question is very

11    different from the agent-focused acceptability used here and in most previous studies in this

12    area. Their question leads the large majority of children and adults to focus on the outcome of

13    actions, rather than the culpability of agents. It also increases the tendency to make outcome-

14    based punishment judgments. But these results, and those of several previous studies, also

15    indicate that young children in particular sometimes base their judgments on outcome even

16    when asked the agent-focused question. The explanation for this might be along the lines

17    suggested by Cushman et al. (2013), according to whose 2-process model the second, intention-

18    focused process only begins to influence children's judgments at about 5 years of age. But we

19    have suggested several other reasons why it is possible that even the findings of this study

20    underestimate children's intention-based judgment. First, when asked the parental knowledge

21    question, many apparently outcome-based judgments were changed to intention-based ones.

22    Second, some children might have wrongly assumed that intentions were congruent with

23    outcomes, in which case their intention-based judgments would have appeared to be based on

24    outcomes. Third, young children frequently misunderstood agents' intentions owing to the

25    complexity of the stories (including a need to understand false beliefs) and to features of the

26    pictures, such as thought balloons. Fourth, outcome was more salient than intention, owing

1    partly to its recency in the text and pictures. And fifth, participants might sometimes have

2    judged well-intentioned agents to be blameworthy because they assumed them to have been

3    negligent.

4        This research investigated the reasons for discrepant findings in the literature on the

5    development of mature, intention-based moral judgment by replicating two studies that

6    strongly support the view that children's moral judgments are primarily outcome-based. When

7    the acceptability questions were changed, almost the opposite was found from 5-6 years of age,

8    and even 4-5 year olds' judgments were influenced at least as much by intention as by outcome.

9    However, other factors must explain some young children's persistence in making outcome-

10   based judgments even when the agent-focused question was asked in this and in other studies.

11   Only future research that systematically tests these factors will reveal the extent to which they

12   can account for outcome-based judgments by young children. These findings indicate that

13   children's moral judgments are considerably more intention-based than most previous research

14   suggests. Quite how much more remains to be seen.

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Appendix: Example interview schedules

1. Accidental harm (positive intention; negative outcome): Psychological harm

| Issue / question | Original (Helwig et al., 2001) | Original (this study) | Experimental (this study) |
|---|---|---|---|
| Preference: Puppies | Here's Ethan. Ethan has a friend named Chris. Chris really likes puppies. He likes to read about them and play with them. When Chris sees puppies, he feels happy because he likes them. | | |
| Comprehension 1: Puppies | How does Chris feel when he sees puppies? | | |
| Preference: spiders | Chris doesn't like tarantulas though. When Chris sees tarantulas, he is afraid. Tarantulas scare Chris. When Chris sees tarantulas he is afraid and he cries. | Chris doesn't like spiders though. When Chris sees big spiders, he is afraid. Big spiders scare Chris. When Chris sees big spiders he is afraid and he cries. | |
| Comprehension 2: spiders | How does Chris feel when he sees tarantulas? | How does Chris feel when he sees big spiders? | |
| Character | Ethan doesn't want to scare anyone. He's nice, isn't he? Yes, he's nice. | | |
| Intention | So, when Chris invited Ethan to his birthday party, Ethan wanted to bring a gift that would make Chris happy. | So, when Chris invited Ethan to his birthday party, Ethan wanted to bring a present that would make Chris happy. | When Chris invited Ethan to his birthday party, Ethan wanted to bring a present that would make Chris happy. |
| Comprehension 3: Character | Is Ethan mean or nice? | Is Ethan nasty or nice? | |
| Comprehension 4: General desire | Does he want to scare anyone? | | |
| Confirmation 1: Spiders | Now, how does Chris feel when he sees tarantulas? | Now, how does Chris feel when he sees big spiders? | |
| Confirmation 2: Puppies | How does he feel when he sees puppies? | | |
| Confirmation 3: Character | Is Ethan mean or nice? | Is Ethan nasty or nice? | |
| Knowledge | Now, Ethan knows that Chris likes puppies. He knows that Chris is scared and cries when he sees tarantulas and | Now, Ethan knows that Chris likes puppies. He knows that Chris is scared and cries when he sees big spiders and is happy and smiles when he sees puppies. | |

| | | | |
|---|---|---|---|
| | is happy and smiles when he sees puppies. | | |
| Behavioural prediction | What is Ethan going to get Chris for his birthday? Is he going to get Chris a puppy or a tarantula? | What is Ethan going to get Chris for his birthday? Is he going to get Chris a puppy or a spider? | |
| Intention | Well, let me tell you what happened. Ethan is nice and wanted to make Chris happy and he knew Chris liked puppies, so Ethan decided to get Chris a puppy for his birthday. | Well, let me tell you what happened. Ethan wanted to make Chris happy and he knew Chris liked puppies, so Ethan decided to get Chris a puppy for his birthday. | |
| Cause | But someone at the pet store made a mistake and put a non-poisonous tarantula, that didn't bite, in the box instead. | But someone at the pet shop made a mistake and put a big spider in the box instead. | |
| Outcome - act | So Ethan gave Chris a non-poisonous tarantula, that didn't bite, for his birthday. | So Ethan gave Chris a big spider for his birthday. | |
| Emotional state prediction | How do you think Chris felt when he got the tarantula? | How do you think Chris felt when he got the big spider? | |
| Outcome - emotion | When Chris got the tarantula he was upset. Chris was scared by the tarantula | When Chris got the big spider he was upset. Chris was scared by the spider. | |
| Acceptability | Is it OK for Ethan to give Chris a tarantula? How good/bad is it to give Chris a tarantula? Is it really, really good/bad or just a little good/bad or just okay? | Is it OK for Ethan to give Chris a big spider? How good/bad is it to give Chris a big spider? Is it really, really good/bad or just a little good/bad or just okay? | Is Ethan good, bad or just OK? How good/bad? Is he really, really good/bad or just a little good/bad or just okay? |
| Punishment | [If acceptability answered bad or OK] Should Ethan get in trouble? A little trouble or a lot of trouble? | Should Ethan get in trouble?  A little trouble or a lot of trouble? | |
| Justification | | *Why* should/n't he get in trouble? | |
| Parental knowledge | | [If should get in trouble:] If his parents found out he tried to give Chris a puppy, *should* they tell him off? Why? | |

2. Attempted harm (negative intention; positive outcome): Physical harm

| Issue / question | Original (Zelazo et al., 1996) | Original (this study) | Experimental (this study) |
|---|---|---|---|
| Introduction | Here's Anne. Anne's parents went on a trip to Brazil, far, far away. You know what they found there? They found a special kind of animal called a dax and they brought it back to Anne. | | |
| Preference: Petting | Now, a dax is pretty normal, it has skin just like you and me. When you pet a dax, it feels good and it smiles | Now, a dax is pretty normal, it has skin just like you and me. When you stroke a dax, it feels good and it smiles | |
| Comprehension 1: Petting | What does a dax do when you pet it? | What does a dax do when you stroke it? | |
| Preference: Hitting | It doesn't like to be hit, though. That really, really hurts a dax, when you hit it. When you hit it, it hurts and it cries. | | |
| Comprehension 2: Hitting | What does a dax do when you hit it? | | |
| Character | Anne is mean. She likes to hurt everyone. She's mean, isn't she? Yes, she's mean. | Anne is nasty. She likes to hurt everyone. She's nasty, isn't she? Yes, she's nasty. | |
| Intention | So, when her parents gave her the dax she wanted to hurt it. | | When Anne's parents gave her the dax she wanted to hurt it. |
| Comprehension 3: Character | Is Anne mean or nice? | Is Anne nasty or nice? | |
| Comprehension 4: General desire | Does she want to hurt anyone? | | |
| Confirmation 1: Petting | Now, what does a dax do when you pet it? | Now, what does a dax do when you stroke it? | |
| Confirmation 2: Hitting | And what does it do when you hit it? | | |
| Confirmation 3: Character | And is Anne mean or nice? | And is Anne nasty or nice? | |
| Knowledge | Now, Anne knows that a dax is normal. She knows that it cries when you hit it and that it smiles when you pet it. | Now, Anne knows that a dax is normal. She knows that it cries when you hit it and that it smiles when you stroke it. | |

| | | | |
|---|---|---|---|
| Behavioural prediction | What is Anne going to do? | | |
| Intention | That's right. Anne is mean, and she wanted to make the dax sad and she knew it didn't like to be hit, so she tried to hit it. | That's right. Anne is nasty, and she wanted to make the dax sad and she knew it didn't like to be hit, so she tried to hit it. | That's right. Anne wanted to make the dax sad and she knew it didn't like to be hit, so she tried to hit it. |
| Cause | But, you know what? The dax wiggled away | | |
| Outcome - act | so she ended up petting it by mistake | so she ended up stroking it by mistake | |
| Outcome - emotion | and the dax smiled. | | |
| Acceptability | Is it okay for her to pet the dax? How bad/good is it to pet the dax? Is it really, really bad/good or a just little bad/good or just okay? | Is it okay for her to stroke the dax? How bad/good is it to stroke the dax? Is it really, really bad/good or a just little bad/good or just okay? | Is Anne good, bad or just okay? How bad/good? Is she really, really bad/good or just a little bad/good/ or just okay? |
| Punishment | Should Anne get in trouble? A little trouble or a lot of trouble? | | |
| Justification | | *Why* should/n't she get in trouble? | |
| Parental knowledge | | [If shouldn't get in trouble:] If her parents found out she tried to hit the dax, *should* they tell her off? Why? | |