Children's Understanding of Traits as Causal Mechanisms Based on Desires

Many years of research into children's understanding and use of trait terms have led to the conclusion that children rarely use such terms spontaneously when describing people until around 6-9 years (e.g. Livesley & Bromley, 1973; Ruble, Newman, Rholes & Altshuler, 1988) and that preschoolers do not understand the concept of a trait as a stable, enduring cause of behavior (see Miller & Aloise, 1989, for a review). Much of the early literature concentrated on the question of whether or not children at a particular age 'understand traits'. However, researchers increasingly acknowledge that the appropriate use of trait terms involves several different conceptual skills and that these may develop at different periods.

by some property of the person. For example, Yuill suggests that traits may be thought of as 'comparatively stable states of mind that generate desires and beliefs' (ibid., p. 270). Only this conception of traits permits inferences about causality. The vast majority of studies address the first type of conception, dealing with behavioral prediction, but very little attention has been given to the causal view, perhaps because it has not been clear how to test this view.

The question of when children become able to use a causal view is given a new theoretical importance by recent research in theory of mind, and the two central concepts of belief and desire (see e.g. Perner, 1991; Wellman, 1990). Work on the development of trait understanding has lacked a strong underpinning theoretical framework, and theory of mind could provide this. Understanding desire seems particularly important as a prerequisite for understanding traits for the following reason: traits provide a rationale for why differences in desires occur, so the perceived need to use traits as explanatory devices will not arise until children understand that such differences in desire exist.

Previous work suggests that understanding of desires begins to emerge at around the age of 2, but continues to become more sophisticated during the preschool years. For example, Wellman property, at about 4-5 years: it is only then that they can understand that different people could have different emotional reactions to the same situation, regardless of the value of that situation, and thus can make what Gnepp and Gould (1985) call 'personalised inferences'.

The present paper examines the understanding of traits as causal in relation to children's developing understanding of desirability. Experiment 1 addresses the issue of how best to assess children's causal understanding of traits, and whether such an ability develops at around the same time that children develop an understanding of desirability as subjective. This study also investigates the different bases on which children might attribute traits. In Experiment 2, we use the method of the first experiment to relate the causal conception of traits directly to children's conceptions of desirability.

Experiment 1

One method of assessing children's understanding of traits as causal is suggested by Gnepp and Chilamkurti (1988). They argued that the idea of traits as internal states causing behavior can be demonstrated by the ability to predict individual differences in emotional reactions to an event. For example, being chosen for the lead part in a play may produce elation in an outgoing child, but dread in a shy child. They asked children and adults to predict emotional or behavioral reactions of story characters when information about previous behavior was either present or absent. Kindergartners were influenced by trait information in predicting behavior and emotion, but this tendency was rather weak until the age of about ten. The authors concluded that 'only the college students, and to a lesser extent, the fourth-graders demonstrated a clear understanding that personality attributions based on past behavior have implications for emotional reactions to future events' (ibid., p751).

There are two aspects of Gnepp and Chilamkurti's conclusions about children's causal understanding of traits that require further investigation, one involving the analysis and one the method. First, the authors did not report the absolute levels of performance against each age (i.e. comparing performance against chance expectancy). As the authors said, children did make more appropriate predictions of emotion with age, but it is not entirely clear whether they understood the principle of traits as internal causal factors: although 6-year-olds showed a significant difference between predictions of emotion in stories with or without prior trait information, their predictions do not seem to be different from chance (average score was about 40% for binary choices), and neither do those of the 8-year-olds. The present study investigates whether young children could perform better than chance when inferring emotions from trait information.

Second, Gnepp and Chilamkurti used a relatively indirect method of investigating emotion predictions: comparing children's emotion predictions either with or without information about a character's previous behavior. A more direct the basis of some kind of superficial similarity in their *description,* or because of a recognition of underlying *conceptual* similarity? Rotenberg (1982) cautions that understanding dispositions should not be reduced to the question of whether children can use the vocabulary items in a superficially appropriate way, but this might be all that is required in the conceptual similarity view. This caution raises the vexed issue of how (and whether) to distinguish between knowledge of language and of concepts. In the conceptual similarity rule, children might use some rather previous behavior, even if it was dissimilar. For example, would one clearly expect the dishonest boy in the above example to be selfish? What would he do if he found his brother wearing one of his scarves? Use of a simple valence strategy would lead to a prediction of selfish behavior, even though there is no clear or necessary reason why a dishonest person might also be selfish.

Of course, even adults show evidence of halo effects (Thorndike, 1920), although they may acknowledge if asked that such a story character may not be all bad. In order to distinguish a simple valence-based strategy from a more considered response, we asked subjects to rate the confidence with which they made different predictions. For a valence-based strategy, children using a simple valence rule should be equally confident of predicting near, far and red-herring behaviors of the same valence as the original behavior. A more considered strategy would produce firmer predictions for similar (near) than dissimilar (far and red-herring) behaviors.

In summary, the present study investigated the bases for trait attribution in children as compared with adults. Children from the age of 4 were tested, because we expected that a purely behavioral conception of traits emerges very early, but the bases on which predictions are made would become more sophisticated with age. Furthermore, we expect a causal view of traits to be evident somewhere between the ages of 4 and 7. The experiment was designed to assess (1) whether children can make correct behavior predictions from trait information, (2) when children can use a causal conception of traits, as shown by the ability to predict emotional reactions for opposing trait pairs, (3) whether children use a simple similarity heuristic, endorsing near but not far behaviors, or alternatively, make predictions consistent with a more broad-based understanding of a trait concept, endorsing far behaviors as well as near ones, and (4) whether children show any evidence 54(haracter)-0.3(of)-130v00.02(alence-based)-15999.0trategy, b y a consherring (far-behavior question), (d) inference of emotion and (e) inference to different traits of the same value (red-herring question). Near-behavior situations varied only in minor details from the original behavior (e.g. the target – a sibling vs a peer, or the object – spilt food vs a broken glass – might be varied) while far-behavior situations involved the same general trait in a different manifestation, e.g. if the original behavior was falsely blaming another for one's own misdeeds, the far behavior might involve stealing flowers: both dishonest, but one involving lying and the other stealing. The questions were piloted on a small sample of adults to ensure that the appropriate inferences could be made, and the results for the adults (see below) support our manipulations of near, far and red-herring questions.

Materials

The trait pairs used were: selfish – generous, cheerful – miserable, honest – dishonest, lazy – energetic, show-off – shy, timid – brave, careless – fussy and clever – stupid. An example story pair and questions are shown in Table 1, together with a summary of the trait terms and predictions for the other story-pairs. For the children, each story was accompanied by seven colored pictures depicting the two trait-consistent past behaviors and the five new situations with the alternative response choices.

Table 1 about here

Procedure

Two sets of traits were compiled, each set incorporating one member of each trait pair, and children were tested on the two sets in separate sessions. The traits in the first set were presented in a different randomised order for each child, and the opposite traits in the second set were presented in the same random order for that child. The questions were asked in a fixed order, as shown in Table 1.

After each response, the child was asked to make a confidence rating in the following way: after a given answer, s/he was asked: Are you very sure, quite sure, or not very sure? On each question, the child was also given a 'can't tell' option. The child thus made a binary choice (picking one of two responses) and then a 3-point rating of certainty (or a 'can't tell' response). Although the red-herring question did not have a 'correct' answer, for present purposes the same-valence choice was scored as correct. Children were shown how to use their hands to indicate their level of confidence: the wider apart, the more sure. Children quickly picked up how to do this and extensive pre-training was not necessary.

Children were tested individually in a quiet room by a female experimenter. A minority of the youngest children who became tired or distracted needed more than two testing sessions, while adults filled in questionnaires in groups, in a single session.

Results

The results are dealt with in three different ways. We first examine whether children's binary choices on the different tasks show performance at higher than chance levels, since we were interested in the ages at which children can reliably make the relevant predictions. We then perform selected ANOVAs to assess specific hypotheses about the relative difficulty of different questions and to assess whether subjects became more reliable with age in making various predictions. Finally, we analyse the confidence ratings to examine hypotheses about the different strategies children might use in attributing traits.

Performance on Alternative Forced Choice Questions

We can assess the different possible criteria for predicting from traits by comparing performance (binary choice) on the different questions against chance (binomial distribution, with p at .01 unless specified otherwise). In the majority of these analyses, we look at the total number of trait *pairs* correct out of 8 at each age, as a stringent test, although in most cases the same results were obtained when considering the more lenient criterion of number of individual traits correct out of 16.

1. Judgement of trait labels

All age groups answered the trait recognition question significantly above chance for the trait pairs overall, though for 4-year-olds this was significant only at $p<.05$, and the general level of performance was not high, as shown in Figure 1. Older children and adults unsurprisingly scored more correct than younger children: an ANOVA on the number of correct pairs at each age showed a significant main effect of age, $F\ (1,4) = 7.3$, $p<.001$, and planned comparisons showed that 4-year-olds scored significantly lower than the other age-groups combined, who did not differ significantly from each other.

2. Near and far behavior

All age-groups from the age of 5 made correct near- and far-behavior predictions beyond chance levels, as shown in Figure 1. The 4-year-olds performed no better than chance on these questions for the set of traits as a whole, although they performed above chance on the near-behavior prediction for one trait pair, honest – dishonest. An ANOVA for the number of correct pairs of near and far predictions at each age showed a main effect of question type, $F\ (1,81) = 37.1$, $p<.001$, with more correct pairs for near than far predictions. As expected, there was also a significant main effect of age, $F\ (1,81) = 9.23$, $p<.001$, as 4-year-olds did more poorly on both questions than the other age-groups. There was no interaction between age and question type, F<1.

Figure 1 about here: available in hard copy only

3. Judgement of emotions

All age groups except the 4-year-olds made more correct emotion judgements than would be expected by chance. The mean number of pairs correct at each age are shown in Figure 1. A one-way ANOVA showed a main effect of age, $F(4,79) = 8.68$, $p<.001$, with planned comparisons (p set at $<.01$) showing 4-year-olds scoring lower than any other age group and 5- and 6-year-olds lower than the 7-year-olds and adults. This question was generally harder than the behavior questions, as might be expected if a causal understanding of traits develops later than a behavioral conception. The most stringent test of this idea is the comparison of emotion and far-behavior questions, since the latter is the harder of the two behavior questions. An ANOVA on the number of correct pairs with age and question type (emotion and far behavior) as factors showed a main effect of question type, $F(1,81) = 15.84$, $p<.001$, as well as the expected main effect of age, $F(1,81) = 10.03$, $p<.001$. The interaction of the two factors was not significant, $F(4, 81) = 2.02$, $p<.10$, but inspection of the means shows that the difference between question types was minimal for the 4-year-olds (unsurprisingly, since they performed below chance on both these questions anyway) and for 7-year-olds, who showed almost identical mean scores on the two questions, apparently because they did unexpectedly poorly on the far-behavior question. Planned comparisons with p set at $<.01$ showed

both dispositional and situational factors determine behavior. This may be particularly true of the psychology students who were our subjects.

Discussion

The results show that children from the age of 5 can make predictions of emotion from trait information. Although we adapted the experimental materials to make the task clear and simple for young children, the test we used was a stringent one: by making opposite predictions about pairs of contrasting traits, children had to use the trait information rather than some other simpler strategy such as social desirability. This finding is consistent with the idea that children develop an understanding of motivational states as subjective at around this age. Experiment 2 investigates the relation of these two skills in more detail.

The 4-year-olds in our study were capable of making predictions about future behavior for the near inference for one of the trait pairs, but never did so for the far inference, suggesting that they had an emerging understanding of traits as behavioral regularities (see also Eder, 1989) and that they did not use simple valence-based cues. Whether they made the predictions on some superficial similarity criterion (e.g. similar behavior to similar targets) or according to a deeper understanding of the conceptual links between similar behaviors is a matter for further research.

None of the age-groups showed evidence of using a simple valence-based rule. If children were using such a rule, then they would have made equally confident and correct predictions for near and far behavior and for red-herring behavior. The pattern of results above suggests that even the youngest children did not use such a strategy, because the same-value red-herring predictions were made consistently only from the age of 6. Although 6- and 7-year-olds chose these same-value, different-behavior red-herring options more often than chance, they still discriminated between these and far-behavior predictions, since they showed significantly more confidence in making predictions about far behavior than about red-herring behavior. Ratings of confidence seem to be rarely used in studies of this type, or with such young children, but the present results suggest that such ratings are a useful technique for teasing out different possible strategies in trait attribution.

It is interesting to note that adults, unlike 6-7 year-olds, did not choose the same-value red-herring option at more than chance levels. In comparison with the adults, the 6-7 year-olds might be said to show a valence strategy, but only in the sense that they endorsed the red-herring option with a low level of confidence. If children of this age are more prone to such valence-based judgements in general, perhaps they may be over-generalising their relatively newly-acquired understanding of the links between behavior patterns and internal states, and in this sense, are in the grip of a theory. Newman (1991) reported a related finding, that school-age children were more likely to predict from traits than adults, who are aware of situational determinants of behavior as well as dispositional ones.

The youngest children showed the most distinctive pattern of responses: this pattern was consistent with a simple situation-matching rule, since they were correct on trait labels, and on near behavior for one trait-pair, but not on far behavior or emotion. Thus, they showed no understanding of the causal aspect of traits or of situational variability. However, it is interesting to note that they too eschewed a simple value-based strategy. Furthermore, there was little evidence in the results overall of positive or negative biases: these would have been apparent if children were correct on one trait of a pair but incorrect on the other (e.g. because they predicted the positive behavior in each case). Where there was evidence of such strategies, they appeared for just four specific trait pairs (the cheerful, lazy, show-off and clever pairs), and there was no consistent bias – for example, on the near-behavior question for the lazy – energetic pair, 6-year-olds were better than chance on energetic but not lazy, while the reverse was true for 7-year-olds.

types was different, because of the within-subjects design. Thus, the relative difficulty of emotion

Table 2 about here

Trait task: Each story was accompanied by four colored pictures depicting the two trait-consistent past behaviors and the alternative choices for behavior or emotion predictions and for the trait questions.

Conceptions of Desirability Task: This task was based on that used by Yuill (1984). Small dolls were used to act out a story in which an actor wanted to hit one of two other potential victims with a ball, this bad motive being represented by a 'think-bubble'. The actor then achieved the desired outcome and the child had to judge whether the actor was happy, sad or in between. Children heard two stories of this type. The objectivist response is to judge the actor sad, because something objectively bad happened, while the subjectivist response is to judge the actor happy at achieving what was desired.

Procedure

Children were tested individually in a quiet room by a female experimenter. The desirability task was always presented before the trait tasks. As in Experiment 1, two sets of traits were compiled with opposite members of each trait pair allocated to different sets. Both sets of stories were presented in the same random order for each child. The forced choice options for all questions were semi-randomised so that half of the time the correct response was given first and half of the time it was given second. Most children completed the task in two sessions but some of the younger ones required a further session in order to ensure their constant attention.

Results

1. Judgement of trait descriptions

In line with Experiment 1, we looked first at whether children gave correct responses to this question beyond chance levels over all the trait pairs as a whole.

2. Inferences of behavior vs emotion

The results for the emotion question differ according to whether trait pairs or individual traits are considered, unlike in the analyses of Experiment 1, where both methods give similar results. This difference seems to arise because the traits for which emotion questions were answered correctly above chance were nearly all non-pairs while traits correct in the behavior condition nearly always were pairs (e.g. selfish – generous). Thus, in the emotion condition, considering number of pairs correct yields performance better than chance only in the 7-year-olds, whereas considering the more lenient criterion of individual traits, children from the age of 4-5 did better than chance, all $ps<.01$, consistent with Experiment 1. For the behavior condition, whether considering pairs or individual traits, children did better than chance from the age of 4-5 ($p<.05$ for this group and $ps<.01$ for older groups). The mean numbers of trait pairs correct for behavior and emotion predictions are shown in Figure 4.

actors felt sad, and who referred either to the intrinsic badness of the act or gave no justification, were classified as objective. Two children who rated the actor as sad, but also mentioned regret, were classified as subjectivist (moral). Children who gave inconsistent judgements were considered non-subjectivist, since they did not show a clear understanding of subjective desirability. There were 63 subjectivists, 2 of whom had given 'moral' answers and 42 non-subjectivists, made up of 26 clear objectivists and 16 inconsistent children.

We compared the mean number of pairs of correct inferences for the behavior and emotion questions for objectivists and subjectivists. The pattern of results was broadly similar whether or not we included the inconsistent children with the objectivists. The data (without the inconsistent children) are shown in Table 3. There was no difference between subjectivist and objectivist children on the behavior question, t (41) = 0.90, $p>.37$, but subjectivists scored significantly higher than objectivists on the emotion question, t (44) = 2.69, $p<.01$. Furthermore, in the behavior condition both subjectivists and objectivists scored above chance, $ps < .01$, but in the emotion condition, only subjectivists did so, $p<.0001$.

Table 3 about here

It might be thought that the relation between conceptions of desirability and causal understanding of traits is due entirely to the fact that both these skills increase with age. To assess this possibility, we computed the Kendall's Tau rank correlation between the two measures, partialling out the effects of age, using the method described by Siegel and Castellan (1988). Conceptions of desirability were scored as 1 for objective, 2 intermediate and 3 for subjective and moral. The trait score used was the number of trait pairs with correct emotion or behavior inferences. The partial correlation for the 54 children in the emotion condition was .31, $p<.001$, while that between desirability and behavior inferences for the 51 children in the behavior condition was not significant, tau = .10, $p>.15$.

Discussion

The results of Experiment 2 show a clear relation between children's conceptions of desirability and their understanding of traits as causal, as hypothesised. Children who understand that desires are subjective states that differ between individuals are also significantly better able to predict idiosyncratic emotions on the basis of traits than children with objective conceptions of desirability. It might be expected that subjectivist children are understanding of traits. Furthermore, the relation of conceptions of desire and emotion inference from traits remains when the effects of age are statistically controlled.

The desirability task tests a rather specific aspect of the understanding of desire: the ability of such predictions than predictions of more similar behavior. Younger children tended to show a situation-matching strategy.

1 References

Berndt, J.J. & Heller, K.A. (1985). Measuring children's personality attributions. In S.R Yussen (Ed.), *The Growth of Reflection in Children.* Orlando: Academic.

Bretherton, I. & Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Developmental Psychology, 18,* 906-921.

De Soto, C.B., Hamilton, M. M. & Taylor, R.B. (1985). Words, people, and implicit personality theory. *Social Cognition,3,* 369-382.

Eder, R.A. (1989). The emergent personologist: The structure and content of 3 1/2-, 5 1/2, and 7 1/2-year-olds' concepts of themselves and other persons. *Child Development, 60,* 1218-1228.

Fletcher, G.J.O. (1984). Psychology and common sense. *American Psychologist, 39,* 203-213.

Gnepp, J. & Chilamkurti, C. (1988). Children's use of personality attributions to predict other people's emotional and behavioral reactions. *Child Development, 59,* 743-754.

Gnepp, J. & Gould, M.E. (1985). The development of personalised inferences: Understanding other people's emotional reactions in light of their prior experiences. *Child Development, 56,* 1455-1464.

Heller, K.A. & Berndt, T.J. (1981). Developmental changes in the formation and organisation of personality attributions. *Child Development, 52,* 623-691.

Ridgeway, D., Waters, E. & Kuczaj, S.A. (1985). Acquisition of emotion-descriptive language: Receptive and productive vocabulary norms for ages 18

Table 1: Example story pair: Experiment 1

SELFISH

This is Mary. She always stops her little brother playing with her toys. Whenever she has a bag of sweets, she eats all of them herself and doesn't give any to anyone else.

NEAR BEHAVIOR

One day Mary sees her little sister putting on one of her hats. Does Mary tell her little sister to take off the hat or let her little sister wear it?

FAR BEHAVIOR

One day Mary's classmates ask to have a go on her new computer game. Does Mary hide it from them or let them have a go?

EMOTION

One day it's Mary's birthday and her Mum makes a delicious birthday cake. Does Mary feel sad or happy about giving the children at her party some of the cake?

TRAIT QUESTION

Which is the best word to say what sort of person Mary is? Selfish or untruthful?

RED HERRING

One day the teacher asks who wants to be in an egg and spoon race. Does Mary say, 'I'll just sit here and watch the race' or 'I'll be in the race'?

GENEROUS

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Other trait-pairs:

PAIR (and TRAIT Q.)	TRAIT INFORMATION	NEAR PREDICTION	FAR PREDICTION	EMOTION	RED HERRING
Cheerful Miserable (Generous Selfish)	quick or slow to forget injury, expect day to be sunny/rainy	response to bus breakdown on school trip	response to visit from cousin	response to pool being closed	admit or deny breaking plate
Generous Selfish (Untruthful Truthful)	permit or deny toy sharing with sib, share sweets	permit or deny brother borrowing possession	response to turn-taking at school	response to sharing party bags	join in or watch race
Truthful Untruthful (Lively Lazy)	admit or deny spillage, pay or avoid paying for tickets	admit or deny breakage	pick apples from tree with or without asking	response to suggestion of returning cash found	response to bus breakdown on trip
Energetic Lazy (Cheerful Miserable)	pick activity or doze, choose hard or easy task	join in or watch race	get up early or late	response to suggestion of walking to school	response to borrower of possessions
Show-off Shy (Rich Poor)	do or just watch party tricks, show or hide work	leader or follower in game	agree or refuse to act on stage	response to chance to go on TV	swim or not after having hair styled
Brave Scared (Sleepy Wide-awake)	avoid or seek scary TV scenes	avoid or seek scary story	ask for or refuse push on swing	response to climbing to top of slide	mend or fail to mend broken machine
Careless Fussy (Hungry Thirsty)	splash in or avoid puddles, crumple or fold clothes	seek or avoid sand play wearing new clothes	change or keep soiled clothing	response to invitation to finger paint	seek or avoid scary film
Clever Not clever (Healthy Unhealthy)	fix or fail to fix bike, remember or forget facts	mend or not mend broken blind	find strategy or not for finding dog	response to being given mendable box	watch or join in song

Other trait-pairs:

PAIR (and TRAIT Q.)	TRAIT INFORMATION	PREDICTION (of behavior or emotional reaction)
Helpful Unhelpful	help old person, carry shopping vs lack of help	request to tidy room
(never/always helps/plays)		
Generous Selfish	share toys with sib, sweets with peers vs no share	request to share new game
(never/always shares/jokes)		
Honest Dishonest	admit to breakage, pay fares vs shift blame, dodge fares	suggestion to return lost money
(never/always does the right thing/works hard)		
Extrovert Introvert	perform vs watch tricks, active vs self-effacing in class	friends laugh at odd shoes
(never/always gets noticed/reads)		
Timid Brave	approach or avoid dog and scary film	suggestion to go to top of slide
(never/always gets scared/talks)		
Careless Fussy	splash or avoid mud, has untidy or tidy room	suggestion to do messy finger-painting
(never/always fusses/laughs)		

Table 3: Mean number of trait pairs correct (/6) in objectivist and subjectivist children for behavior and emotion predictions

	Conception of desire		
	objectivist	subjectivist	difference
Prediction			
Behavior	2.29	2.79	0.50
Emotion	1.15	2.61	1.46