

Is she smiling or is she happy? Is there a fundamental change in children's understanding of the meaning of facial expression?

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Introduction

Research seems to provide manifold evidence that even infants are able to distinguish at least positive and negative facial expressions of emotions. On the other hand studies with older children using free labeling tasks reveal a rather late development of the ability to correctly label facial expressions of emotions (Widen & Russell, 2003).

In a pilot study with German children that aimed to replicate these results children were given the task to label drawings of facial expressions. Surprisingly, the labels used by German children differed from the expected pattern. The majority of the 3- and 4-year-olds labeled the social meaning of a facial expression (*smiling* instead of happy, *crying* instead of sad, and *naughty* (German "boese") instead of angry) and did not label the emotion. In contrast from age five onward the number of children who named the emotion displayed in a facial expression increased clearly. These results can be interpreted as fundamental change in children's conceptual understanding of facial expression of emotion. While younger children focus on the social meaning older children begin to understand that these expressions are additionally associated with an inner (psychological) state. With increasing understanding of emotions as inner states children start to label facial expression not as a social signal (e.g. smile) but as a symbol of an inner state (e.g. happiness).

Purpose of the Study

1. The first purpose of the current study was to examine whether the observed effect that younger children label the social signal and older children label the emotion could be replicated using photographs or drawings varied as a between-subject factor.
2. A second purpose was to test the hypotheses that children with a better insight into mental states (theory-of-mind) label the emotion and not the signal.

Method

Participants:

119 3-, 4- and 5-year-olds participated in the experiment.

Half of the children had to label happy, angry, sad, and fear expressions in photographs and half of them labeled these facial expression in drawings.

Design:

A 2 (photograph or drawing) x 4 (Age) x 5 (expression) mixed design was used with repeated measures on the last factor.



Additional material:

ToM. German translation of the Theory of mind-Scale by Wellman und Liu (2004) consisting of 5 tasks :

- (Not-Own Desire)
- (Not-own Belief)
- (Knowledge Access)
- (Contents False Belief-Task)
- (Appearance Reality)

Language. Two subtests of a German battery of language development (SETK; Grimm, 2001). This battery measures expressive language skills.

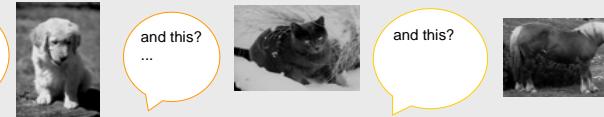
- Sentence Comprehension: Finding pictures that contain a verbally given description (e.g. "the man cooks")
- Morphological rules: assesses the ability to use the plural form of different words.

Order of presentation:

1. Labeling Task (photo or drawing)
2. ToM-scale
3. Language development

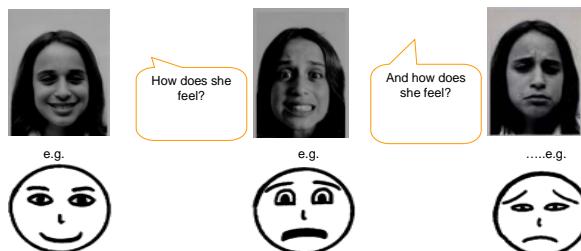
Procedure

Children were trained in the labeling task by first giving them the task to label animals.



Labeling of the facial expressions

Children were presented in random order either 4 photographs or 4 drawings.
"Now, I have brought you some more pictures each of them with a face of a child. The child shows us, how she is feeling right now. And you should tell me, how the child feels, o.k.?"



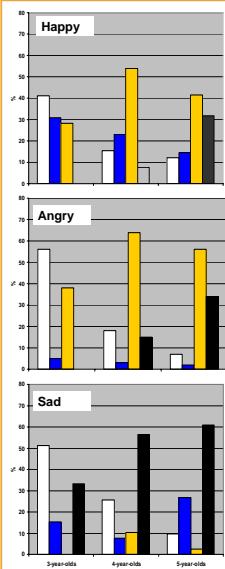
Photos from Linda Camras and used by Widen & Russell (2003)

Drawings from Janke (2005)

Results: Social Signal or Emotion?

1 Type of Label

To examine whether children are labeling the emotional state or the social signal all labels were categorized in to the categories *Social Signal*, *Emotion*, *Valence* und *Wrong Answers*, *Others* (see Table 1). There was no effect of material.



Happy / Angry

- Labeling social signals increased from 3 to 4 years of age and decreased from 4 to 5 years of age.
- More than 30% of the 5-year-olds labeled the emotion.

Sad

- Social signals were rarely named in case of sadness.
- More than 30% of the 5-year-olds labeled the emotion.

Afraid / Surprise

- Less than 5% of the children used a label for fear or surprise

Table 1: Categories

	Happy	Angry	Sad	Afraid
Social Signal	laughing, smiling, funny, friendly	naughty, nasty, to scowl	cries, howling	?
Emotion	happy, lucky, glad, cheerful	angry, furious, Enraged	Sad	fearful, anxious, afraid
Valence	good, not bad	bad,	bad,	bad,
Wrong	don't know other	not good	not good	not good

Quality of labeling and ToM

2 Quality of Labeling

A second scoring system was used to calculate correlations with theory of mind measures. (e.g.. Denham, 1996; Widen and Russell, 2003).

Points	Happy	Angry	Sad	Afraid	surprised
0	bad	good	good	don't know	eyes open
1	good	bad	bad	bad	
2	happy	angry	sad	afraid	surprised shocked

3 Theory of Mind, language and quality of labeling

- Quality of Labeling and ToM ($r(119)= .48$, $p < .01$).
- Quality of Labeling and Language ($r(119)=.25$, $p < .05$).
- Correlation between Quality of Labeling and ToM remained significant even when age and language abilities were controlled (partial $r(115)=.24$, $p < .01$).

4 Intercorrelations between Quality of Labeling, Theory of Mind and Language separated for each age group

	Table 3		
	3-year-olds	4-year-olds	5-year-olds
Quality of Labeling	-	-	-
ToM	.36 *	.42 *	.15
Language	.34 *	.44 *	.35 * .43 ** .32 * .23
** $p < .01$. * $p < .05$.			

- Correlation between Quality of Labeling and language ability remains significant.
- Correlation between Quality of Labeling and ToM decreases probably as a result of ceiling effects in the ToM-Scale.

Discussion

When 3- and 4-year-olds label facial expressions of happiness and anger they predominantly label the social signal or valence of an expression. Only the 5-year-olds start to label the emotion when given the task to label a facial expression. This interpretation holds only for the happy and angry expressions.

Children's labeling behavior should be interpreted as a preference rather than a lack of correct labels. Results are in accordance with work by Fridlund (e.g. 1997) who suggests that facial expressions serve mainly as a social signals.

Moderate positive correlations between quality of Labeling and ToM support our hypotheses of a relation between understanding of mental states and understanding facial expressions as inner states rather than social signs.

Results reveal again difficulties to freely label emotions from facial expressions in young children (Russell & Widen, 2003). This holds especially for afraid and surprised.

Whether children interpret facial expressions as a part of an emotional state or "only" as a social signal is still an open question.

References

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