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Emotional Recognition Ability of Autistic Children

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ABSTRACT

The aim of the present study was to study the emotional recognition ability of children with autism. Popular clinical perception highlights autistic children's deficits in expression of emotion. Several studies have tested the hypothesis that people with autism are emotionally flat because they cannot understand emotional expressions and a current trend in research indicate conflicting results. The present study had adopted a control group design with 20 subjects in each group. Inclusion and exclusion criteria for the clinical group comprising of moderate to high functioning autistic children were specified. Each group was exposed to three conditions- schematic, still and dynamic, where the task was to identify the appropriate emotion in the picture/clip presented. Preliminary results indicate that though the average performance of the clinical group in identifying emotions was superior in schematic condition identifying followed by dynamic human clips, but they showed slight deficit when presented with still human pictures. Their performance was also significantly poor than the non-autistic children. These results suggest that emotion perception impairment is not likely to be the primary underlying deficit in autism. A finding to this effect has important implications for the diagnosis, classification, assessment and treatment intervention for autistic children. Further results are discussed in the paper along with directions for further research.

Emotional Recognition Ability of Autistic Children

Autistic disorder is characterized by symptoms from categories of qualitative impairment in social interaction, impairment in communication and restricted repetitive and stereotyped patterns of behavior or interests. India is home to about 10 million people with autism and the disability has shown an increase over the last few years. Children with autism are perceived to have profound problem with the social world. It is assumed that typically, autistic children do not show any need for affection or contact with anyone. They frequently make eye contact and their gaze is said to have an unusual quality. Laboratory studies with high functioning autistics have found that they may recognize others' emotions without really understanding

them. There are broadly 2 theories that suggest why children with autism are not able to understand emotional expressions. The affective theory, originally proposed by Kanner (1943) suggests that in autism there is an innate inability to enter into emotional touch with other people; and the Cognitive theory focuses on the autistic child's difficulty in understanding other people's mental states, that is, theory of mind deficit. The role of facial expression in activating and regulating emotion experience has become a lively topic of research and theoretical discussion.

In recent years there has been a revival of interest in Kanner's (1943) proposal that autistic children "have come into the world with an innate inability to form the usual, biologically provided affective contact with people" (p. 250).

Two factors that have contributed to this focus on autistic children's affective impairments are the newly emerging experimental studies of emotion recognition in autistic children, and an increasing awareness that at least some of the cognitive abnormalities so typical of autism might need to be understood in the context of, or even as the developmental outcome of, 'basic' social-affective impairments. Both clinical and experimental evidence highlight autistic children's deficits and idiosyncrasies in the facial, vocal and gestural expression of emotion.

There is a weight of empirical evidence to support Darwin's (1872/1965) suggestion that normal human beings are biologically predisposed to exhibit certain patterns of bodily form and movement in the expression of affective states. This applies to facial expressions, vocalizations and probably also gestures. At the conclusion of his own account of *The Expression of the Emotions in Man and Animals*, Darwin (1872) reflected that "there seems to be some degree of a *priori* probability that their recognition would likewise have become instinctive... It is however extremely difficult to prove that our children instinctively recognize any expression".

There is now a small but consistent body of experimental evidence to suggest that autistic individuals are abnormal in their attentiveness to facial expressions of emotion, and are impaired in their capacity to discriminate and recognize other people's facial, gestural and vocal expressions of affect. The evidence comes from studies that have compared autistic and non-autistic retarded individuals matched for chronological age and for one or the other aspect of cognitive ability.

In a study by Izard (1971) it has been shown that 3 yr-olds may be able to indicate which of a series of photographed facial expressions is happy, sad, afraid, etc, and to make appropriate choices of schematically drawn faces to complete the picture of a person in situations that might lead the person to be happy, sad, afraid or angry. In a study of children's ability to identify the emotional meaning of vocal

expressions, Dimitrovsky (1964) presented 5-12 yr-olds with tape recordings of prose delivered in a voice expressing anger, happiness, 'love' or sadness, and asked them to select a stick-figure drawing (depicting facial and bodily gesture) of the man that it sounds like. Five yr-olds performed poorly but above chance levels and subjects' scores increased gradually with the children's age.

Jennings (1973) tested autistic, non-autistic retarded and normal children who were presented with sets of three photographs of people, and were asked to indicate which two were the same. The photographs could be grouped according to facial expressions, or the presence or absence of hats. Only the autistic subjects paired more frequently on the basis of hats than on the basis of facial expressions. Similar findings were reported by Weeks & Hobson (1987).

Langdell (1982) matched autistic and non-autistic retarded children for age and performance on the Wechsler Intelligence Scales for Children (WISC) (full-scale), and found that all his subjects could sort photographs of happy and sad faces when given whole faces or the lower halves, but autistic subjects were less able to sort the upper halves of the faces. His study reported that autistic adolescents, who were able to identify schematically drawn happy and sad faces, were more impaired than control subjects in sorting the faces by the eye areas. However, the experimental work by Langdell (1978) and Attwood (1984) indicated that autistic children are not markedly impaired in the recognition of all kinds of 'meaning' inherent in faces and gestures.

Hobson *et al.* (1988 a) adopted a similar methodological approach in testing autistic adolescents and young adults for their ability to classify photographed faces and parts of faces according to identity and emotion. In this instance, autistic and non-autistic subjects were matched for age and verbal ability. The results indicated significant group differences in the profiles of performance on the emotion' sorting

tasks but not on the identity sorting tasks. In the first experiment 23 subjects selected facial expressions of emotion (both drawn and photographed) to go with different gestures, vocalizations and contexts depicted on videotape and then in drawings. In a subsequent task subjects selected drawings of emotionally expressive gestures for videotaped faces and audio taped vocalizations. Autistic children demonstrated a marked impairment in choosing appropriate drawings and photographs of facial expressions of emotion to "go with" videotaped gestures, vocalizations and contexts characteristic of happy, unhappy, angry and fearful feelings. Similarly, the second experiment which was a modification of the earlier one, involved four emotion recognition tasks (of six basic emotions) and six tests of object or event recognition (non-emotion tasks). This study also, in congruence with the previous one, furnished evidence that relative to non-autistic control subjects, autistic adolescents and young adults have more difficulty in choosing photographed faces of emotion for recordings of emotionally expressive voices than they do in choosing photographs to accompany non-emotional meaningful sounds.

In another study by Tantam et al (1989), ten autistic children in comparison to 10 non-autistic children matched on chronological age and performance IQ were tested on their ability to interpret faces by finding the odd facial expression of emotion. The tool that was used was pictures from Pictures of Facial Affect (Ekman & Friesen, 1976) on 6 basic emotions. In one of the condition, a word card was also presented alongside the photograph and the subject asked to identify the picture which went best with the word. Their results, replicated the findings of Hobson as the autistic children performed less well than the non-autistic children at finding the odd expression and odd person out thus suggesting a specific perceptual abnormality in at least some children with autism.

A study by Ozonoff et al (1990) tested the hypothesis that young autistic children are selectively impaired in one domain of social and affective development which is emotion perception. Fourteen autistic children, matched

on sex and verbal measure of mental age with non autistic children were tested for emotion perception deficits through sorting, matching and cross modal approaches on 3 emotions (happiness, sadness and anger). The results of Study 1 fail to support the hypothesis of specific emotion perception deficits in autistic children and were not coherent with Hobson's findings.

Reviewing past literature, it may be concluded that there is a lack of evidence for specific emotion recognition deficits in autism, or at least for marked differences between autistic and non-autistic subjects which are consistent across the diagnostic groups. Moreover, it is not established that to what degree, the autistic children's impaired performance bears a specific relation to their failure to grasp the meaning of expressions of emotion, either within the setting of the task or within more natural social situations. A methodological issue that must be attended to in studying the primacy of the social deficit is task design. Past literature indicates that three different approaches have been adapted to assessing the emotional recognition ability of autistic children. These are: sorting (pair pictures with one or the other of 2 target pictures), matching (first developed by Braverman (1986) requires subjects to match a set of pictures with a target picture) and cross modal procedures (in which subjects are required to pair the facial expression of emotion with a congruent voice, gesture or context). Out of these only cross modal procedures would reduce the possibility of using perceptual strategies based on visual spatial cues. It can be said that poorer performance on the social form of the cross modal task may simply reflect the difficulty of the task, rather than the autistic child's knowledge of the social world. Moreover, only limited number of studies (Hobson 1988) assessed on more than 3-4 emotions. Even though few studies used video clips, the nature of their use is unclear (example videotape of a live but still dog or exaggerated full body bodily gestures of every emotion) thus limiting their natural effect and context. Unfortunately, in many studies of emotion perception, issues of reliability and validity were either not attended to or not reported. Studies with sample size fourteen and below have also

used complicated inferential statistic tools like ANOVA and t test, putting very grave questions on their reliability. Besides, the researcher could not access even one study pertaining to Indian or Eastern population indicating a dire need for the present study in this area.

Researchers and clinicians alike have struggled to identify the nature of the underlying deficit central to autism, one of which is emotional recognition. Although evidence for the primacy of the social deficit in autism is building, this hypothesis is by no means universally accepted. Studies show that some domains, such as self-recognition and the ability to sort and match photographs of faces by identity appear relatively intact in the autistic child. . This has direct implications on diagnostic assessment and intervention with autistic children. Moreover, the present study addressed the methodological issues of previous studies and incorporated the multiple modes of visual stimuli in order to better assess the emotional recognition ability. Static representations do not capture the internal and external dynamics that are of the essence of bodily expression of emotion, and they generally fail to depict all else that is characteristic of particular expressions, particularly when an individual is placed in a context. To some degree, facial and gestural expressions which are presented on film may circumvent some of these problems (Frijda, 1953), and in the present study an attempt was made to integrate films and drawings of the various expressions. The present study is an experimental investigation of autistic children's seeming failure to comprehend the emotional expressions.

Method

The study followed a controlled group design using the purposive and snowball sampling technique to identify the respondents.

Sample

A total of 20 subjects in each group of children with Autism and children with normal development (Table 1) were chosen. Inclusion

and exclusion criteria for each population were specified, which included age range of 6-16 years, boy or girl for both populations. Moreover, mild-moderate to high functioning Autistic children as determined by developmental assessment and diagnosis in the absence of any co-morbidity were included in the research.

Table 1
Descriptive Characteristics of the Two Groups

	Clinical	Control
Sex Ratio	17 boys, 3 girls	9 boys, 11 girls
Mean age in years	11.45	10.65

Procedure

Children were contacted through various NGOs, clinics and schools in Delhi. Each organization was informed about the objectives of the research, the approximate time required and informed consent was duly taken from the parents. Thus, non probability purposive sampling and snowball sampling were used to data collection. *Pilot phase:* A pilot test of 2 children with autism and 2 children with normal development was undertaken to familiarize the researcher with tools and potential (if any) difficulties associated with the conduction. During this phase the researcher realized the need for limited number of options to be presented for each emotion, especially to the clinical population. Thereafter, a list of 3 options for each emotion was prepared randomly.

Tools

Three kinds of stimuli were used based on Ekman's list of 6 Basic Emotions. Facial expressions of emotion have been systematized by Ekman and Friesen (1975), who have published a large set of photographs of posed facial expressions which have been extensively validated. These have been used in studies of the interpretation of facial expression by mentally handicapped people and by people with schizophrenia as well as in studies of children's ability to interpret facial expressions. The following are the conditions (kinds of stimuli):

Schematic diagrams. The first visual stimuli involved the use of 6 schematic diagrams (smiley faces) of emotions of happy, sad, fear, anger, surprise and disgust from those that appear in Visual Language of Schematic Faces, duly laminated with uniform size of A4. The exposure time for every picture was a maximum of 20 secs.

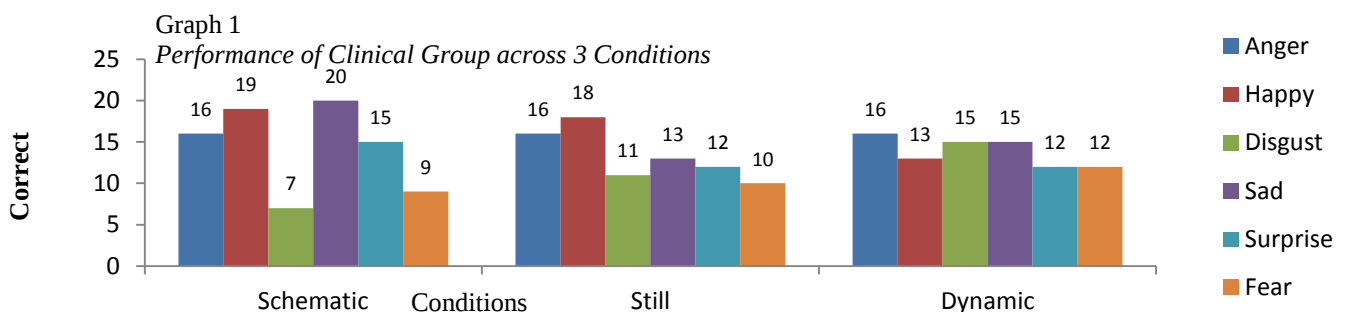
Static photographs. A set of six photographs of faces of a woman with expressions of happy, sad, fear, anger, surprise and disgust were selected from those that appear in *Unmasking the Face* by Ekman & Friesen (1975). High-quality black-and-white photocopies of these faces were employed, each duly laminated with uniform size of A4. The exposure time for every picture was a maximum of 20 seconds.

Dynamic videos. A set of 10 second 6 silent clips of people with facial expressions and focus on the six basic emotions were selected to be presented to the participant on the

researcher's laptop. The exposure time for every picture was a maximum of 2 trials.

The researcher sampled daily Indian soap operas, national TV programs and popular movies to identify clips adequately demonstrating the 6 basic emotions. Hence, the method of selection of clips was purposeful. Clips initially selected by the researcher were screened for 10 normal adults who viewed each clip and were asked to identify the emotions. The videos that were most often identified correctly as displaying the right emotion and rated as most intense on the specific emotion were included in the final study.

In conjunction to schematic and still pictures, video clips were employed in order to capture the 'aliveness' and 'context' of the expressions in replicable form. This methodology ensured that the children attend to the meaning rather than the perceptual configuration of the respective stimuli. Clips were simple and natural, with focus on face.



Results

Table 2

Clinical Group: Percentage of Correct Responses across 3 Stimuli

	Anger	Happy	Disgust	Sad	Surprise	Fear	%
Schematic	16	19	7	20	15	9	71.6
Still	16	18	11	13	12	10	66.67
Dynamic	16	13	15	15	12	12	69.16

Table 3

Control Group: Percentage of Correct Responses Across 3 Stimuli

	Anger	Happy	Disgust	Sad	Surprise	Fear	%
Schematic	18	20	14	20	20	16	90
Still	8	20	17	18	17	14	78.3
Dynamic	20	19	18	19	19	19	95

Graph 2

Performance of Control Group Across Three Conditions

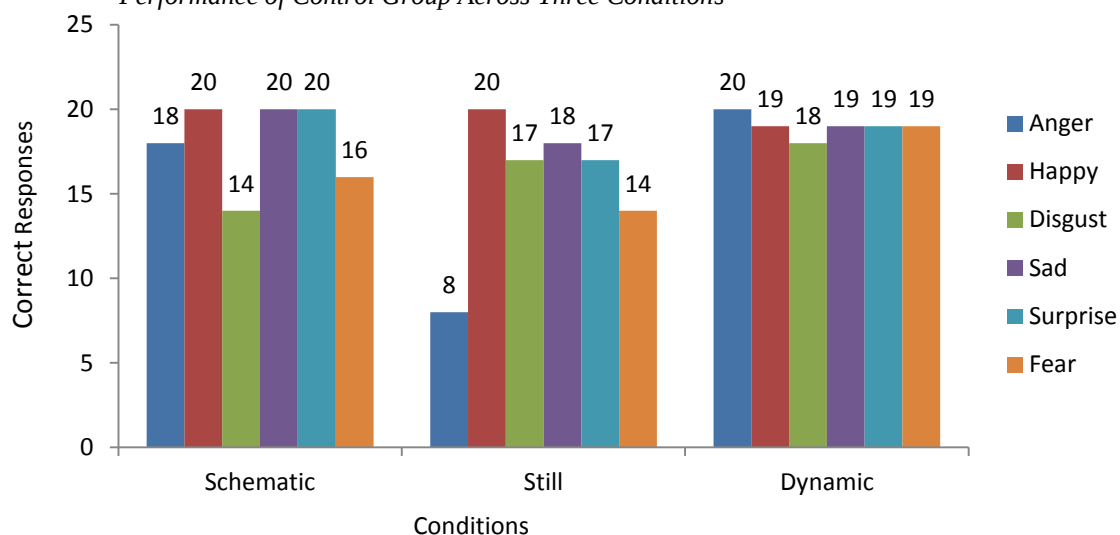


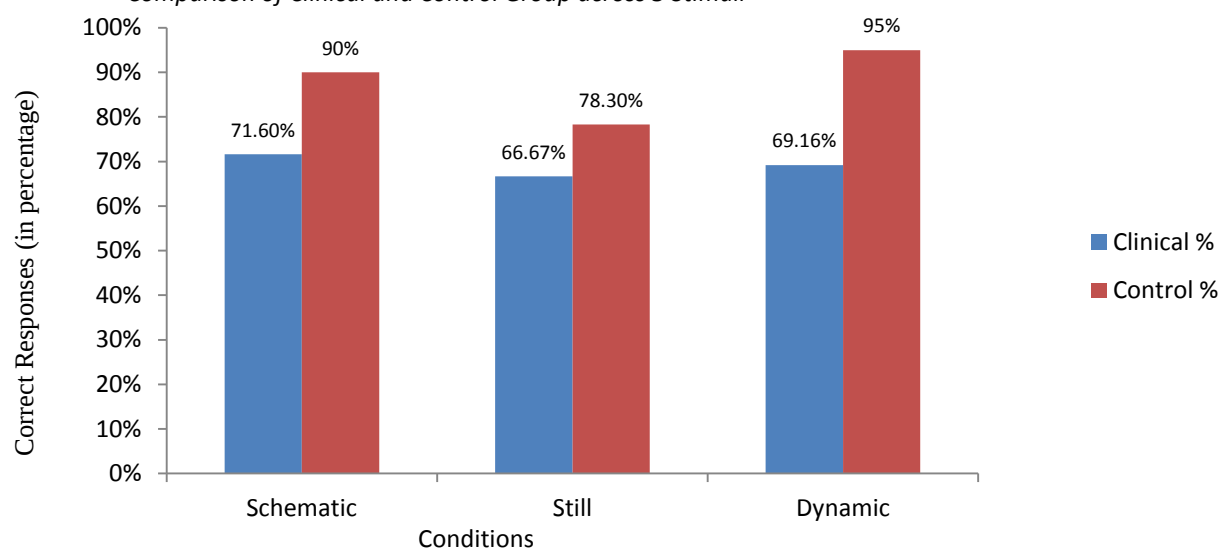
Table 4

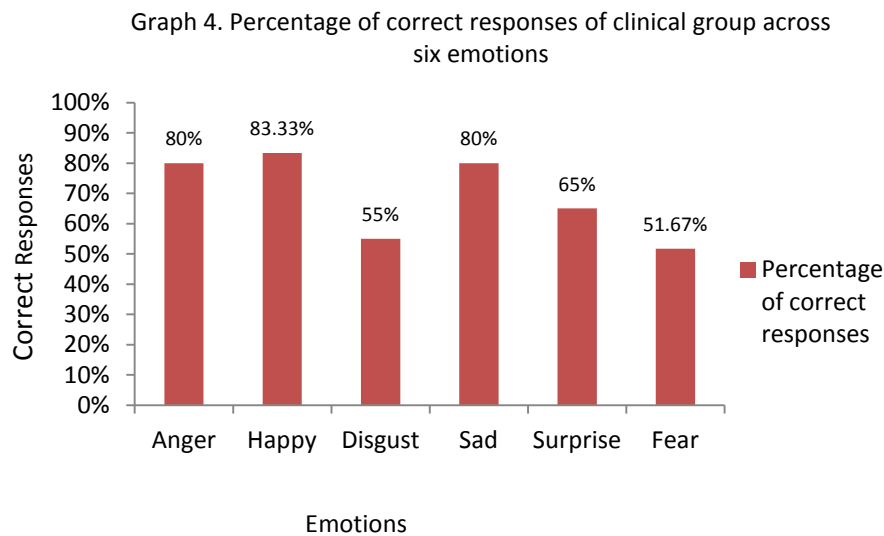
Comparison of Clinical and Control Group across 3 Stimuli

	Clinical %	Control %
Schematic	71.6	90
Still	66.67	78.3
Dynamic	69.16	95

Graph 3

Comparison of Clinical and Control Group across 3 Stimuli





Emotion	% of correct responses
Anger	80
Happy	83.33
Disgust	55
Sad	80
Surprise	65
Fear	51.67

Discussion

As can be seen in Graph 3, according to descriptive statistics, the autistic children did not perform as well as the control group across the three stimuli for recognition of six basic emotions. It is further noticed that within the clinical group, the autistic children performed best when presented with schematic diagrams (71.6%), followed by dynamic video clips (69.16%) and least in the second condition of still pictures (66.67%). The researcher further intends to perform tests of inferential statistics to arrive at a conclusion of significant difference, which will aid the findings to provide an evidence for practical implications of the present study. It is also observed from Graph 4 that on an average, 83.33% of autistic children were able to correctly recognize happiness, followed by anger and sadness (80%), surprise (65%), disgust (55%) and fear (51.67%).

Also, as seen from Graph 3, the performance for both groups decreased (78.3% for control group and 69.16% for clinical group) when presented with still photographs of facial expressions as extracted from Ekman's standardized set of photographs. These findings have important implications for the study.

Poor performance of both groups on the second condition raises questions about validity of the stimuli used. Even though the photographs by Ekman & Friesen (1975) are well established tools also used in past researches, it is perhaps not applicable to cultural context in which the study was conducted.

Also, what is interesting to notice is how autistic children respond differently to different stimuli. As noticeable, there is a very minor difference in the average performance on Schematic and dynamic condition. This finding stands in stark contrast to popular clinical perception of autistic children not being able to pick up social cues. The finding therefore partially failed to replicate previous investigations.

If there is a primary deficit in the social and affective sphere in autism, only a subset of processes may be affected. In evaluating the primacy of a particular set of impairments, the following criteria need to be satisfied. Any deficit considered primary should be present in all autistic children and should distinguish them from other clinical groups; that is, the deficit should be both universal and specific to autism.

In addition, a primary deficit should be one of the most persistent and impairing features of the disorder. Finally, a primary deficit should not be one that can be considered secondary to other autistic features. If emotion perception impairment is truly the fundamental deficit underlying autism, one can expect it to be a more robust phenomenon apparent across studies, paradigms and control groups. In at least one study which supported the existence of specific emotion perception deficits, the authors pointed out that the size of effects was surprisingly small (Braverman et al., 1989) suggesting that group differences were statistically, but not practically, significant (Ozonoff, 1990). While it appears that there may be some impairment in affect perception abilities in autism, the evidence for the primacy of this deficit is not convincing, as Ozonoff (1990) says, the deficit thus is neither universal nor specific to autism, but may be a correlate or secondary consequence of a different, more fundamental disability in the social-affective realm. Thus it can be speculated that autistic children may have difficulty, but not capacity deficit in emotional recognition.

The emotion recognition abilities are not completely absent in autistic children. The results of this study provide suggestive evidence towards qualitative differences in the evaluation of emotional meaning of facial expression of simple emotions by autistic and non autistic children.

Implications and Future Directions for Research

The findings of the present study have direct implications, especially on the assessment one makes of an autistic child. The diagnosis of social and emotional deficits is likely to be dependent on the tool being used for assessment. As evident from present and past studies, if the tool is not accurate, then it will not be truly representative of child's capacities. Thus, methodological issues must be thoroughly taken into account when working with autistic children. Such findings also have implications on the intervention programmes being carried out with autistic children. As evident from the study, autistic children are to a great extent able to pick

up emotions from social cues (dynamic condition). Thus the need of the hour would be to incorporate these observations and build intervention programmes based on interactive stimuli in order to hone such skills in autistic children.

A limitation worth mentioning in the present study is that various non specific impairments of some of the autistic children such as inattentiveness, shorter gaze fixation and repetitive pattern of choosing options did not allow the researcher to gather whether the chosen option was an accurate depiction of child's abilities. Further studies in emotional understanding of autistic children are required to reconsider the primary deficit of social impairment in autism, which is indicated as only relative difference in comparison to the normal group in the present study.

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About the Author



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