

The “Colour Family Drawing Test”: A Comparison between Children of “Harmonious” or “Very Conflictual Families”

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Received 29 September 2014; revised 25 October 2014; accepted 17 November 2014

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Abstract

The “Colour Family Drawing Test” applied a classification of colours on an emotional basis leading to the distinction between “Alarming and Serious” (black, grey, violet, olive-green, dark blue, red, yellow) and “Reassuring and Playful” hues (pink, sky blue, orange and pastel colours). 120 participants (aged 7 - 10 years, both genders), attending Rome primary schools, were individually examined. They sat at a table with a white A4 card, 24 colour pencils, a black pencil, an eraser and received the instruction: “Draw your family”. The research objective concerns the introduction of colours and the evaluation of emotional meaning of the colours used by children in drawing their families. The families had been preliminarily evaluated as Harmonious or Very Conflictual Families through a semi-structural interview conducted with the children’s teachers. The drawings made by children of Harmonious Families consistently used reassuring, playful colours ($p < 0.01$); children of Conflictual Families used alarming, serious colours ($p < 0.01$). The parents also compiled the LDM Inventory, in order to have a confirmation of their level of psychological conflict. 33 “Very harmonious” parents and 22 “Very Conflictual” parents were selected. A comparison revealed that N/H scores were significantly lower in parents of Very Conflictual Families compared to the opposite ones ($t_{53} = 2.95$; $p < 0.01$). Conflictual Parents do not develop harmonious interpersonal relations, preferring overt aggression, with particular consequences for the family’s emotional atmosphere and for the children’s personality.

Keywords

Colour, Emotion, Family Drawing Test, Children, Styling, Assessment

1. Introduction: Antecedents and Previous Studies

The sphere of physiognomic qualities is characterised by a dual role with respect to other properties of configurations. The first role is the one known longer and consists of the fact that every physiognomic quality is conveyed by a specific combination of shapes, colours and so on, that is, structural and/or constitutive qualities triggering suitable meaning attribution processes in the beholder (Arnheim, 1954, 1964; Metzger, 1954; Bonaiuto, 1965). In other words, the physiognomic qualities are typically conveyed by shapes, compositions, sizes, colours, textures, etc., and have a subordinate role with respect to the other qualities. The former have thus been considered as dependent variables (and thus called “tertiary” qualities) with respect to the structural and constitutive qualities (“primary” and “secondary” ones), established as independent variables.

Other authors, still of phenomenological training, had instead insisted on the “primary” feature sometimes also taken on by physiognomic properties because they are found in the experiences of both children and adults with aspects of prominence and apparent immediacy (Werner, 1940; Metzger, 1954, 1966). Moreover, some experimental demonstrations have indicated that *certain emotional qualities grasped inconfigurations can affect the perception of structure*. This goes to constitute a second role in opposition to the one mentioned above. For example, Schafer & Murphy (1943), Postman, Bruner, & McGinnies (1948) and various other researchers tried to experimentally demonstrate that the qualities of meaning can affect the perception of dimensions, the figure-background organisation and so on. This led to the introduction, amongst other things, of the reference to the processes of perceptual defence or facilitation and resonance.

Along these lines, various experimental demonstrations conducted by our research group over the last twenty years have found that the perceptions of danger and threats or, the opposite, of reassurance and playfulness, *can trigger perceptual defence mechanisms*, in the first case, *and perceptual facilitation processes*, in the second. For example, in an exemplary study carried out by Giannini, Biasi, & Bonaiuto (1995) on incongruity visual perception, the degree of inclination of silhouettes of leaning buildings was underestimated if the image had been printed on *grey-purple* paper, while the same anomaly was emphasised if the colour was *bright pink*. These colourings were precisely assessed by using the “Natural Colour System” and the “Spectra-Light” bright box. The predictions and explanations we put forward are based on the fact that the *combination* of the *structural anomaly* (incongruent inclination) and a “serious and alarming” colour (grey-purple) gives rise to a relatively *intense conflict*, such to *activate perceptual defence*, with the resulting underestimation of the disturbing structural incongruence. On the other hand, the coexistence of an architectural anomaly (the inclination) with a “playful and reassuring” colour (pink) may favour acceptance of the incongruence and its valorisation (*facilitation effect*).

Similar results have been obtained with other architectural anomalies, such as shape in “*fractured buildings*”, for which the beholder has to assess the degree of sideways shift of the upper section with respect to the lower one of three-dimensional architectural models painted with either “serious and alarming” hues or “playful and reassuring” ones. Even the depiction of an urban incongruence, that is, a *traffic congestion scene*, was affected by the use of “serious and alarming” colours and symbols, which inhibit the evaluation of the number of vehicles crowding the scene. On the other hand, “playful and reassuring” colours and symbols give rise to a significant effect of acceptance and facilitation in evaluating the anomaly (Bonaiuto, Giannini, Biasi, Miceu Romano, & Bonaiuto, 1997). In any case, the systematic study of relations of shapes, colours, textures, sizes etc., with *meanings* appears a promising field also for its applications in the psychology of art.

Another source of relevant information consists of the “*drawing recall*” experiments, causing short-term stress or comfort states. For twenty years we have been performing experiments with adults who are asked to remember stressful or comfortable situations they have been in, and to represent them in drawings (Biasi & Bonaiuto, 1997a, 1997b, Bonaiuto, Giannini, & Biasi, 2003). In the obtained drawings, characteristics of pictorial language (e.g. consisting of shapes of represented surfaces, presence or absence of colour, its scarcity or abundance, distribution, tonality, saturation, etc.) play a meaningful role. It is possible to study the relationships of pictorial language with other psychological variables. According to the experimental setting, the subject sits at a table with light pieces of drawing cardboard (32 × 24 cm), a black pencil, an eraser, a black pen, thirty-six coloured pastels, and thirty-six coloured felt-tip pens. Participants are in general young adults (19 - 39 years of age) treated individually including both genders. Each person is asked to represent their own individual stressful or relaxing real-life experiences. Each drawing session lasts 20 minutes.

In the first case (stress) the *instructions*, given orally to the subject, are as follows: “Now try to imagine and focus on a personal, particularly stressful, anxiety arousing, troubling and unpleasant situation. It can be a past

experience or a present one that you have felt in this way. Try to represent this experience with the materials here at your disposal. Do it freely, as you are able to, using whatever you wish...” Usually, the subjects understand these instructions very well and start to produce interesting drawings, of which we have many examples. One of the main topics is urban congested traffic. People also draw car accidents, arguments in the family, broken relationships, examinations, feeling isolated, the illness or death of relatives. Sometimes they represent stress in symbolic or abstract ways: black sun, blots, straight and interrupted segments, etc. As we can directly see from the drawings produced, in spite of the rich materials at their disposal, the subjects mostly use only black and white.

In the opposite treatment, other subjects are asked to recall “... a personal, particularly relaxing, comfortable, pleasant and enjoyable situation...” The remaining instructions are as above: “It can be a past experience or a present one, that you have felt in this way. Try to represent this experience with the materials here at your disposal. Do it freely, as you are able to, using whatever you wish, etc...” In these comfort drawings the main represented topics are the contemplation of nature landscapes, flowers, trees, animals, the sea, etc. Also, they draw to depict successful sport activities; or relaxing with their favourite books, listening to music; or having social or intimate relationships, etc. As we can see in the examples, colours are fully represented, including coloured contours, shadings, polychromies and other similar peculiarities. Shapes become rounded, the lines more continuous, and drawn surfaces more extended, showing many details; moreover, other specific aspects are represented.

Employing these techniques we fully examined a total of 240 participants, obtaining a series of quantitative data.

Considering the *graphic-pictorial language* used in the obtained drawings, we found more than *fifteen pairs of bipolar indicators* able to differentiate the images used on average in the two contrasting types of drawings, when independent examiners systematically evaluated their perceptual properties (including dispositions, style of execution, etc.). The graphic pictorial languages used in stress or comfort drawings appear clearly opposite; and this was confirmed when the judges, working methodologically in double-blind conditions, systematically evaluated the drawing properties and peculiarities.

In recollecting stressful situations, as we have said, subjects use, on average, a large quantity of straight lines, angular surfaces, black contours, and black and white representations (without colours). When colours are present in stress drawings, preference is given to black or, in any case, achromatic contours, dull colours, cold colours, alarming colours, extreme contrasts and conflicting colours, fragmented and less extended coloured areas. Colours are sometimes visible as speedy action tracks. Together with the larger number of straight lines, angular surfaces, simplification and executive haste, colour inhibition or its selection and use appear expressive of *conflict*, and the selected aspects express negative emotions, aggression, defence, avoidance of feelings.

Because chromatic colour is generally connected with the world of emotions, colour avoidance and denial appear as a display of defence against pain, suffering and trouble in dealing with stress, and especially distress. Haste and speed in colouring also express reluctance in experiencing, recognizing and staying in contact with one’s own emotions during stress recollection; and also the energetic gestures revealed by static depictions directly express aggression and rigidity, which are the two main effects of stress on motivational and cognitive levels.

On the other hand when recollecting comfort situations, subjects mainly use coloured contours (instead of achromatic contours), bright and warm colours, gradations, playful and reassuring colours, uniform and more extended coloured areas, together with curved and continuous lines, circular surfaces, rich details, executive accuracy, etc. The types of colours selected and used express attempts to solve and avoid conflict. Also, they express positive emotions, well-accepted needs, pleasure and prolonged contact with inner feelings.

We can summarize that, according to the phenomenological classification of perceptual qualities, three groups of qualities are listed (Metzger, 1954; Bonaiuto, 1965). The properties of objects are distinguished as:

- 1) *Structural Qualities* (Shape, Size, Position, Composition...)
- 2) *Constitutive Qualities* (Colour, Texture, Consistency...)
- 3) *Expressive Qualities* (Emotional, Intentional, Functional, Causal...)

These groups of qualities recognize reciprocal relations and are interconnected. For their interconnectedness, colour may convey even emotional qualities. A classification of colours on an emotional basis was made by Bonaiuto and collaborators in 1995 and led to the distinction between “Alarming and Serious” versus “Reassuring and Playful” colours. The first category includes the following colours: black, grey, violet, olive-green, dark blue,

with yellow and red stripes. The second category includes pink, orange, sky blue, light green, light yellow, and other pastel colours (Table 1).

Another important distinction was made by Biasi & Bonaiuto (2006), by rigorously and systematically studying the colour illustrations of fairytale books published in Italy over the previous forty years. Earlier preliminary surveys had shown the relative frequency with which illustrators use round shapes and colours which we have defined as “playful and reassuring”, while in the second case, that is negative characters, there is a predominance of angular shapes and “alarming and serious” colours (Biasi & Bonaiuto, 1997a). Starting from these premises, Biasi & Bonaiuto (2006) catalogued one hundred full-colour images of entire figures of positive and benign protagonists and another hundred images of negative characters: evil, monsters, giants, with alarming colours, and rich in different kinds of incongruities.

Two independent and particularly expert judges evaluated a broad range of formal, chromatic and physiognomic qualities by also analysing the presence of some basic perceptual phenomena, such as a modal completion, or expectation contradiction, leading to incongruous images. The concordance indexes obtained were sufficiently high, with peaks of even 0.70. “Blind” conditions were assured with respect to the sources as well as the systematic rotation of the boards to be evaluated and of the evaluation scales. The statistical comparisons reveal that the positive and benign characters have a variety of colours and shades of a playful and reassuring kind, amongst which pink, sky blue, light green, white, yellow, brown and red. The negative and evil characters instead have a predominance of alarming and serious colours; the aforesaid colours are now replaced with, or supplemented by, purple, black, grey, olive green, with red and yellow stripes. With the positive characters there are more frequent warm colours, shades, curved lines, rounded shapes, continuous lines; and situations of agreement. With the negative characters there are relatively more frequent cold colours and colour contrasts.

On this basis, some classical studies were conducted such as those of Hippus (1936) and Krauss (1930), on meanings attributed to linear drawings in black and white. A special contribution was made in the late 1970s by constructing a projective Test for detecting expressive sensitivity: the so-called “Linear Shapes and Coloured Bands” (Bonaiuto, 1978). The boards composing the test were set up by the author in a mainly intuitive manner by using particular graphic-pictorial aptitudes. It is a multiple choice task. Each table has five labels only one of which is shared by perceivers on statistical bases, while the other four labels are not plausible. The correct answer is: “Comicality” depicted with pastel colours (light yellow, light orange); Painre presented with depicted violet and black tonalities.

After these observations, it was possible to add a new indicator concerning the perception of “Alarming and Serious Colours” versus “Playful and Reassuring” ones.

2. The “Colour Family Drawing Test”

2.1. The Investigation with Children: Research Objective, Instruments and Procedure

The research objective concerns the introduction of colours and the evaluation of emotional meaning of the colours used by children in drawing their families.

Biasi and Bonaiuto, 2005 consistently drafted the Full-Colour Family Drawing Test as a development of Corman’s (1964) classic black and white test. With the new procedure, each participant sat at a single table, with a white rectangular card, 24 well-sharpened coloured pencils, a black pencil, an eraser and a pencil sharpener.

Table 1. List of “Alarming and Serious” versus “Reassuring and Playful” tonalities.

Colours Tonalities	
Alarming and Serious Colours	Reassuring and Playful Colours
Black	Pink
Grey	Orange
Violet and Dark Blue	Sky Blue
Olive Green	Light Green
Red and Yellow Streaks	Pastel Tonalities

S/he received this verbal instruction: “Draw your family”. Note that this formula is the original one used by previous authors (Appel, 1931; Cain & Gomilla, 1953; Fukada, 1958; Porot, 1952, 1965).

In the experiment, 120 participants (aged 7 - 10 years, of both genders), belonging to Italian families living in Rome and attending primary schools in the city, were individually examined. Note that graphic abilities are generally represented on a normal distribution, so these variables do not enable results with quite a large sample. The families were evaluated through a semi-structured interview conducted with the children’s teachers, and were divided into two categories: Harmonious Families *versus* Very Conflictual Families. The first category includes parents who can guarantee affective support, maintaining harmonious interpersonal relations. The opposite category is instead characterised by a high degree of parental conflict, expressions of open violence within the family, difficult separation or divorce either underway or imminent (Hulse, 1951; Spigelman, Lungs, Sweden Spigelman, & Englesson, 1992; Roe, Bridges, Dunn, & O’Connor, 2006), the presence of family members with negative characteristics (drug addiction, imprisonment, etc.), and extreme poverty.

The semi-structured interviews are conducted with the children’s teachers rather than directly with the parents, in order to preserve a greater objectivity of the evaluation itself.

2.2. Results

As regards graphic pictorial language, the research group found that the children belonging to Very Conflictual Families mostly used “Alarming and Serious Colours” (Grey, Black, Dark Blue, Purple, Olive Green; see [Figure 1](#), [Figure 2](#)) in their family depictions instead of “Reassuring and Playful Colours” (Pink, Orange, Sky Blue, Light Green, Light Yellow, other pastel colours; see [Figure 3](#), [Figure 4](#)), typical of the other children.

The evaluation of the main colours used in a sample of 40 “Colour Family Drawings” made by children belonging to “Very Conflictual Families” versus a sample of 40 “Colour Family Drawings” made by children belonging to “Harmonious Families” was performed by three independent judges, as showed in [Table 2](#).



Figure 1. Colour Family Drawing by a child of a “Very Conflictual Family”. The main colours used are violet, grey, black.



Figure 2. Colour Family Drawing by a child of a “Very Conflictual Family”. The main colours used are olive green, dark blue, violet.



Figure 3. Colour Family Drawing by a child of a “Harmonious Family”. The main colours used are pastel colours like light yellow, light blue, light green, pink.



Figure 4. Colour Family Drawing by a child of a “Harmonious Family”. The main hues used are bright yellow, orange and pink.

Table 2. Frequency percentage of colours used by children belonging to “Very Conflictual Families” versus children belonging to “Harmonious Families”.

Colours	Colours Family Drawings		
	From Conflictual Family (n = 40)	From Harmonious Family (n = 40)	Statistical analysis
Alarming and Serious Colours	10 (25%)	1 (2.5%)	$F_{(1, 79)} = 9.32$ $p < 0.01$
Mixed	25 (62.5%)	21 (52.5%)	n.s.
Playful and Reassuring Colours	5 (12.5%)	18 (45%)	$F_{(1, 79)} = 11.54$ $p < 0.01$

Furthermore, the children of Very Conflictual Families used mainly angular shapes and broken lines instead of rounded shapes and continuous lines, preferred by the children of the opposite category. The drawings of children of Very Conflictual Families were also significantly less accurate, more irregular and deformed, while the drawings of the children belonging to the Harmonious family category were more accurate, regular and well shaped (these last data confirm the previous specific literature: Corman, 1964; Porot, 1952, 1965; Comunian, 1984; Zavattini, Tambelli, & Mossi, 1989; Tambelli, Zavattini, & Gasperini, 1990).

3. New Investigations on Lifestyle Defence Mechanisms as Indicators of Psychological Conflict

The Lifestyle Defence Mechanisms (LDM) Inventory, was originally produced by Spielberger (1988), and Spielberger and Reheiser (2000) in the United States, and then applied, also with other co-workers, in some European Countries. In Italy the work of translating and locally adapting the LDM was carried out by us in cooperation with our colleague from Padua, Anna Laura Comunian, producing some research reports (Comunian, Biasi, Giannini, & Bonaiuto, 2004, 2005). This work led to an exploratory factor analysis, the replacement and improvement of some items of the original composition of the LDM Inventory, maintaining the same total number (24 items). Then a confirmatory factor analysis was carried out along with a check of the meaning equivalences with bilingual participants, versed in both languages, Italian and English.

The LDM Inventory consists of two separate scales, each containing two subscales. The first scale, called “Need for Harmony” (NH), includes twelve items and is in turn divided into two subscales: “Self-Sacrifice” (SS) and “Harmonious Relations” (HR). According to the original construct, which was derived from the pioneering studies of Grossarth-Maticeck (1979, 1980), these components focus on the efforts to achieve and maintain harmonious relationships with family and friends.

The second scale, called “Rationality/Emotional Defensiveness” (R/ED) includes another twelve items and is the sum of two subscales: “Rationality” (RAT) and “Emotional Defensiveness” (EmD). These components focus on the frequency that a person engages in rational, anti-emotional thought processes and behaviours (Spielberger, 1988; Spielberger & Reheiser, 2000. See also Fernandez-Ballesteros, Zamarron, Ruiz, Sebastian, & Spielberger, 1997).

The Application of LDM Inventory to Parents for Assessing Their Level of Psychological Conflict

The parents of each participant were studied by applying personological instruments such as the Lifestyle Defence Mechanism Inventory (LDM, Spielberger & Reheiser, 2000; Comunian, Biasi, Giannini, & Bonaiuto, 2004, 2005), in order to assess their level of psychological conflict. The Lifestyle Defence Mechanism (LDM) Inventory includes subscales evaluating tendencies to avoid interpersonal conflicts (*Need for Harmony*) and to pursue interpersonal *Harmonious Relations*, even at the cost of *Self-Sacrifice*, to prefer denial, repressions and rationalizations in the face of emotional complexity (*Rationality and Emotional Defensiveness*). By means of the scores obtained in the various scales and subscales of the LDM Inventory, parents of Very Conflictual Families were clearly distinguished from those belonging to Harmonious Families.

Among the main indicators, the N/H (Need for Harmony) Scale, along with the HR (Harmonious Relations) and SS (Self Sacrifice) subscales, resulted significantly discriminative. The LDM Inventory, compiled by a total of 55 parents, was carried out on extreme cases of the two categories of families, with respect to the interviews conducted with the children’s teachers, as we said before. A number of “Very Harmonious” parents ($n = 33$) and of “Very Conflictual” parents ($n = 22$; both genders represented) were selected (Table 3). A comparison revealed that the N/H (Need for Harmony) Scale scores were significantly lower in parents of Very Conflictual Families with respect to the parents of Harmonious Families ($t_{53} = 2.95$; $p < 0.01$).

The Need for Harmony Subscale consists of two factors. The first is called *Harmonious Relations* (HR), in which lifestyle stresses the need to maintain harmonious relations with others. The second is called *Self Sacrifice* (SS), described as the desire to sacrifice one’s own needs in order to maintain those relations. Both these factors underlying the Need for Harmony are higher in Parents belonging to Harmonious Families and lower in Parents belonging to Very Conflictual Families (respectively: $t_{53} = 2.53$; $p < 0.01$ and $t_{53} = 2.23$; $p < 0.04$). We can interpret this as meaning that Conflictual Parents are not particularly interested in developing and maintain harmonious interpersonal relations, preferring, for example, overt aggression, with obvious consequences for the family’s physiognomy and emotional atmosphere as well as for the children’s personality.

4. Conclusion

The data collected from experimental and clinical settings confirm that, on the whole, the “Alarming and Serious” colours turned out to be *violet*, *grey*, *black*, *dark blue* and *olive green*, possibly including *red and yellow stripes*, while the so-called “Reassuring and Playful” colours were mainly hues of *pink* as well as *orange*, *sky blue*, *light green*, *light yellow* and other *pastel colours*.

Table 3. Scores obtained in the various Scales and Sub-Scales of the LDM (Lifestyle Defense Mechanisms Inventory) by parents of Harmonious Families and of Very Conflictual Families. Means, standard deviations (in parentheses) and statistical significance of the differences are according to the Student t test.

	Scale N/H Need for Harmony	Sub-Scale HR (Harmonious Relations)	Sub-Scale SS (Self Sacrifice)	Scale R/ED Rationality/ Emotionality Defensiveness	Sub-Scale RAT (Rationality)	Sub-Scale EMD (Emotional Defensiveness)
Parents of Harmonious Families (n = 33)	36.85 (5.06)	20.33 (2.45)	16.52 (2.93)	29.00 (5.60)	15.30 (2.78)	13.70 (3.63)
Parents of Very Conflictual Families (n = 22)	32.91 (5.21)	18.48 (2.91)	14.91 (3.19)	29.52 (5.49)	14.86 (3.32)	14.71 (3.15)
Statistical Analyses	$t(53) = 2.95$ $p < 0.01$	$t(53) = 2.53$ $p < 0.01$	$t(53) = 2.93$ $p < 0.04$	$t(53) = 0.30$ <i>n.s.</i>	$t(53) = 0.93$ <i>n.s.</i>	$t(53) = 1.31$ <i>n.s.</i>

The aforementioned attempt by Abegg (1973) to get some children to use some coloured pencils was made in a very limited way. The examined subjects only had six colours available to them: blue, red, yellow, green, brown and black. His only note in this regard concerns a relationship with personality, in the direction already delineated by Eysenck (1941), and namely that more extroverted subjects chose warm colours, while more introverted subjects preferably chose green, blue and grey. Abegg also mentioned the case of an orphan who had drawn his dead father using the colour purple, made by mixing red and blue: a finding that may appear consistent with our overall studies. In other words, studies by previous authors lack a clear understanding of connections between colour hues, meanings and personality, as illustrated only recently thanks to the systematic distinction made between “Alarming and Serious” colours as opposed to “Reassuring and Playful” ones.

As mentioned above, Bonaiuto, 1978 introduced a distinction between “Alarming and Serious” colours and “Reassuring and Playful” ones. As we said, studies followed on the illustrations of fairytales and comics, firstly investigated in an occasional manner, and then in a rigorously systematic way (Biasi & Bonaiuto, 1997a, 2006). Following the Natural Colour System (NCS) (Scandinavian Colour Institute, 2004), the “Alarming and Serious” colours correspond to specific codes.

For example, Olive-Green is 10 30-R60B. The “Reassuring and Playful” colours also correspond to specific codes; for example, Orange is 05 85-Y60R. These labels are useful to clearly identify the tonalities. Moreover, what is more important is the emotional meaning of these hues that are recorded and detected by using bipolar scales with contrasting adjectives, such as “Alarming”, “Serious”, “Disquieting”, “Reassuring”, “Playful”, etc.

In our studies the two experimental groups, relating to the opposite types of family described above, appeared clearly differentiated by the graphic-pictorial indicators used in the “Colour Family Drawing Test”. In addition, the characteristics of Very Conflictual or Harmonious Families are thus underlined by the LDM Inventory: we can interpret that Conflictual Parents are not particularly involved in developing and maintaining harmonious interpersonal relations, preferring, for example, overt aggression, with obvious consequences for the family’s physiognomy and emotional atmosphere as well as for the children’s personality.

In conclusion, in our investigation there is a convergence of parameters related to the opposite types of family interviewed: the characteristics of Very Conflictual or Harmonious Families appeared well identified by the structured interviews conducted with the children’s teachers, clearly differentiated by the graphic-pictorial indicators used, and by the LDM Inventory.

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