

## Interior Color Concept for Behavioral Therapy of Autistic children based on Lovass Method (ABA)

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Autistic therapy room interior design is an element of environment created for autistic children. Elements constituting an interior design such as color can create an environment or atmosphere that supports the healing process. Color can be psychologically influential. Autistic patients possess an ability to be stimulated by psychological effect of colors. The purpose of this research was to create an interior design color concept of behavioral therapy rooms for autistic children based on Lovass/ABA method. The color concept or composition in accord with the autistic child's character and Lovass/ABA method are the color with low intensity that can increase the ability to concentrate, improve the child's emotion and give comfort.

Key words: color psychology, interior design

Desain interior ruang terapi autis merupakan lingkungan buatan yang keberadaannya berhubungan langsung dengan anak autis. Melalui elemen-elemen yang membentuk sebuah desain interior, seperti warna, dapat diciptakan sebuah lingkungan atau suasana ruang yang mendukung proses terapi. Warna dapat memberi pengaruh secara psikologis. Penderita autis memiliki kemampuan untuk merasakan rangsangan yang dihasilkan oleh efek psikologi warna. Tujuan yang ingin dicapai dari penelitian ini adalah membuat suatu konsep warna interior ruang terapi perilaku anak autis sesuai dengan metoda Lovass/ABA. Konsep warna atau komposisi warna dengan intensitas warna rendah interior ruang terapi yang sesuai dengan karakter anak autis dan metode Lovass/ABA adalah warna dan komposisi warna-warna yang dapat meningkatkan kemampuan konsentrasi, emosional, dan kenyamanan.

Kata kunci : psikologi warna, interior ruang terapi perilaku autis

Child development disturbance could be an annoying trouble for the family. Autism, fragile x, down syndrome and cerebral palsy are some of syndromes of developmental disturbance, and autism is the most severe and the most prevalent (Handojo, 2003). Autistic children are growing up in number although twenty years ago, the case rarely happened. Chairman of YAI, Dr Melly Budhiman in a press conference commemorating World Autism day in Jakarta, April 2 2009, said that autism was growing up, and not only happened in big cities, but also in urban areas, although there was not any survey ever done. Indicator of increase of cases was patients being treated. In 1990, 3-4 patients were treated compared to 99 patients nowadays, 12 patients were autistic, and three of them were new patients 2-5 years of age. Moreover, autism is really not a disease, but developmental neurologic

disturbance that influences the brain function so that they find it difficult to interact and communicate effectively (Kominfo, 2009). Autistic children need special treatment so that they can interact, communicate, and socialize well.

Autism is a bunch of symptoms of behavioral disturbance which is varied among children. Behavioral disturbances show up as less social interaction, eye contact avoidance, difficult to develop language skill and behavior initiation. Handojo (2003) stated that autistic children have disturbance in behavior development such as speech and occupation so that they could not behave as normal children, if not taken care of quickly, the learning process would be hindered. Intelligence, emotion, and social behavior could not develop well.

Peeters (2004) in his book Autism said that autistic children process information differently. They hear, see, and feel but this sensation is processed in different way, that is why autism is defined as qualitative disturbance in communication and social interaction. Qualitative

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disturbance leads to pervasive developmental disturbance, primarily in cognition, psychomotor, and social relationship.

Peeters (2004) stated that preparing autistic children to face adulthood so that they are able to integrate well in the society can be done in a therapy center or in a special school. It needs a special therapy room to give a quality therapy. Arrangement and interior design of the room is important because teaching learning room is the essence of therapy.

Not only psychological environment plays important role in influencing development and education of children, but also the physical environment. Psychological environment is very much influenced by physical environment (Sari, 2004), for instance eye contact needs a room with calm interior. Color plays an important role in interior design (Pile, 1995), in all aspects of interior design, color is the most important thing. It is important to include strong and comfortable color into the interior design. Comfortable atmosphere can be created by using certain color composition, thus motivating and enhancing teaching learning process, increasing concentration, and supporting therapy being done. Physical environmental need of autistic children is different from the rest in character. Autistic children are sensitive to light, so therapy room needs to be designed with soft color (Sari, 2010).

Comfortable environment should be made to support therapy of autism because they are frequently angry, psychologically unstable, and difficult to concentrate or socialize. Kaplan, Sallis, James, and Patterson (1993) revealed that environment contribution to healing process of autism was 40%, medical factor was 10%, genetic factor 20% and other factors as big as 30%. Because environmental factor plays a crucial role, it needs to be given a lot of attention, especially in designing healing facility such as therapy room.

Interior design of therapy room is connected directly to the patients, and through color as the element of design, a good comfortable environment can be built to support therapy process with the hope that therapy would make a fast and strong effect.

Color as a stimulus has been believed since old Egypt and Greece to have effects on health. Psychologically, color has a great influence on mood and emotion. Physical sensation can be formed through color (Pile, 1995). For children, color experience is more direct than shape or form experience because they are more interested in color. Sharpe (1974) stated that children were more interested in color than shape, and color could be used as a stimulus. So, interior color could give psychological influence on children. Bond (2000) said

that the psychological effect that color has on children is very powerful.

The purpose of this study was to use color concept as behavioral therapy for autistic children in accord to Lovass/ABA method. Psychological effect of color in therapy room could increase concentration, emotional condition, and comfort. By doing so, therapy room is created to support teaching learning process and maximal effort in therapy.

The word autism comes from the word auto meaning alone, so autistic individuals feel that they live in their own world. It was introduced for the first time by Leo Kanner, a child psychiatrist in John Hopkins University, in 1943.

Autism is a complex developmental defect caused by brain damage so that communication development, socialization ability, sensory, and learning ability are compromised. Autism is developmental disturbance, conceptual disturbance, and pervasive disturbance, and not a mental disease (Peeters, 2004).

Therapy is needed to alleviate the symptoms. Sari (2010) revealed that many schools had provided many kinds of special therapy for autism, such as drugs, certain diet, and psychological effect of color on therapy room. Application of color composition could give psychological effects on children connected with their inability to concentrate, emotion instability and their memory.

Color could give impression, and this impression was interpreted as psychological effect that influences feeling and psyche or soul (Birren, 1961). The problem is could autistic children who have specific condition feel the psychological effect of color? Diana Mary Pauli from School of Education University of Birmingham in 2004 was doing a research entitled *Engaging The Feeling And Will Of Children With Autism Through The Medium Of Colour*. Pauli found that autistic individuals have the ability to feel stimuli produced by color. This finding was supported by Gunilla Gerland (1997), a young woman from Swedia being diagnosed as autistic, who stated that color was more readily understood even when other things failed. She further told that color sometimes played a role as a connection to the mind (in Pauli, 2004). Matthews (1994) concluded in his thesis; *Stimulus Overselectivity, Stimulus Generalization, and Visual Context in Adults with Autism*, that autistic children can be stimulated by shape as big as 33%, color as big as 26%, and location as big as 16%.

So color can psychologically influences autistic children and can be used as a stimulus, but color should be in appropriate with character of the children and goal of room therapy activity. The primary therapy goal is to have autistic children make eye contact, and this activity

needs concentration, calm and quiet situation, and these conditions could be prepared by making certain color composition. Autistic children's character and psychological effect or stimulus from therapy room is then connected. The color in accord with children need can increase therapy and teaching learning process.

The purpose of this study was to make interior color concept in accord with Lovass/ABA method, a color that could give influence on concentration ability, emotional stability, and comfort. So the therapy room as created physical environment could support teaching learning process or maximal healing therapy.

## Method

Data was gathered through literature study, journal articles, and text books related to the study. Methods of therapy and the relationship between methods and therapy rooms or autism characteristics were searched, to find criteria of interior design acceptable for autistic therapy. Then, color was chosen in accord with design criteria, with the hope that these would support therapy activity and maximal teaching learning process.

## Results and Discussion

The general method commonly used to treat autism is ABA method, because it is easy to use and the level of success is high. Applied Behaviour Analysis (ABA) is a method for behavioral treatment that has developed since several decades ago, and the creator is not clear. Ivar O. Lovaas from the University of California, Los Angeles (UCLA), America, used this method intensively on autistic children, and quite successful. He then promoted and recommended this method to treat autistic individuals so that this method is widely known as Lovaas method (Handojo, 2004:50-61).

ABA or Lovaas method is well structured and has good material so that it is easy to use. The basic techniques of ABA in designing room therapy among many are:

1. Obedience and eye contact is a key to get into ABA method. If children are obedient and able to make eye contact, then it will be easier to teach them something.
2. *One on One* or one therapist for one child. If necessary, a co-therapist is needed to act as prompter.
3. Teach behavior step by step from simple to complex. Teach color concept, shape, numbers, alphabet, and so on.

One consideration in designing room interior was the method being used in therapy. Therapy room needed

according to ABA method is one on one therapy room where behavior activity, speech therapy and occupancy were done. First, obedience and eye contact were taught in therapy room since eye contact was the key to do subsequent activities. Second, classical room in which one therapist treated 3-4 children, with the purpose of teaching children to socialize. Third, play room to do therapy activities with playing equipment and to develop sensory capability and self protection

Every therapy room based on ABA method has different kind of activities, and as a consequence the environment and facility should be different. For one to one therapy room, to increase concentration, quiet environment is needed, monochromatic pastel color is the most suitable with color gradation. For classical and play rooms to train to socialize, varied color can be applied to induce happy environment. So, ABA method and color is connected.

### Relation between Autistic Children Characteristics and Behavioral Therapy Room

Relationship between autistic character, therapy room, and color is close. In autistic therapy room, physical and psychological characteristics of autistic children, therapy method influence criteria of therapy room and color, so physical design is related to clients' need.

Relationship between autistic characteristics and criteria of physical of therapy room:

- a. Primary characteristic of autism is no eye contact. They live in their own world, so to treat this condition, one on one therapy is needed. If they can make eye contact, they are willing to communicate. For this to happen, special room is needed in order to focus attention and limit eye view so that the view of autistic child is centered to the therapist.
- b. Verbal and non verbal communication disturbances. Autistic children tend not to speak because they could not response to the environment and as a consequence they do not care and do not want to learn anything. They need to be intensively and continuously treated in a comfortable, quiet room so that they can increase their attention.
- c. Excessive behavior; hyperactive and temper tantrum such as scream, kick, bite, scratch, hit, and so on. Very often they hurt themselves or self abuse, so they need a safe room where there is no sharp material that can hurt them, and sound proof.
- d. Deficit behavior indicated by speech disturbance, inappropriate social behavior, sensory deficit as if they are deaf, inappropriate emotion like laughing or crying or daydreaming. A comfortable room supports

Table 1

*Autistic Children Characteristics and Criteria of One on One Therapy Room*

Characteristic	Room Criteria
No eye contact, not focus, loner	Faciliate attention
Difficult to socialize, verbal and non verbal communication disturbances, tantrum	Safe, quiet, faciliate attention
Not afraid of danger, imbalanced motoric ability	Safe, no sharp or poisonous material
Deficit behavior, laughing, crying, shouting, and so on	Sound proof
Sensitif to lighting	Indirect soft lighting

good social behavior, and a sound proof room is necessary to anticipate voices from outside as well as their own voices like laughing, crying, shouting, and so on.

- e. Autistic children are sensitive to light, so soft lighting would be appropriate, using indirect lighting.

Discussion about relationship between autism characteristics and one to one therapy room can be seen in Table 1.

Therapy room should provide every activity and meet autistic child's need in order to give quality and maximal results. Room arrangement is crucial since this is a core activity of autism therapy center. Design and physical facilities should meet the need of autistic child (Sari, 2006). Papanek (1983) stated that in the process of designing, social behavior should be taken into account. These needs act as a starting point in participatory relationship between users and designer, and should be the primary consideration in designing therapy room.

### Interior Color Concept of One On One Behavioral Therapy Room

Appropriate color gives balance and vitality to the room. Perfect application helps the balance and harmony with environment. Color also has effects on mental, physical, and emotional health, mind and behavior. Color in the room could give relaxed and calm atmosphere.

Color could give certain atmosphere to the room, and should be appropriately designed in accord with activities being done so that energy and influence does not go against each other. Color could affect visual appearance of the room.

Color can stimulate autistic children. As individuals with special personality, being so sensitive and passive, autistic children have the ability to feel stimulus given by color. (Pauli, 2004).

Therapy room is chosen in accord with characteristics of autistic children and therapy method, then color concept is made in accord with needs and therapy goals. Those considerations can be seen in figure 1.

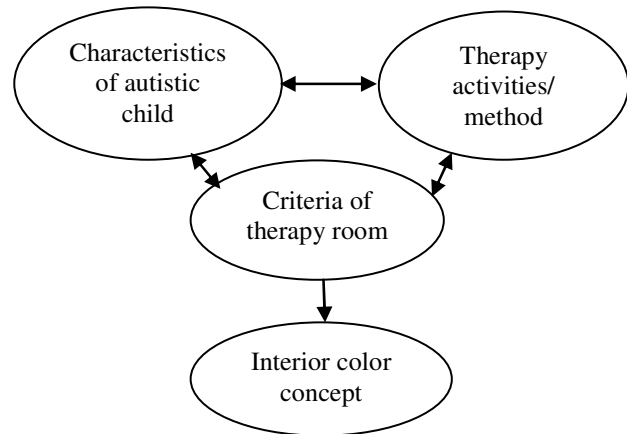


Figure 1. Considerations of color concept



Figure 2. Eye contact therapy

Note: Cited from Fadhel (2010)

Core activity in therapy room is to train the child to follow instruction of the therapist such as eye contact between therapist and the child, to train good behavior so that he could be accepted by his environment by reducing inappropriate behavior such as mumbling, laughing, crying, shouting, moving hands, and so on. Eye contact is a must so that the child can get rid of his own world and concentrate on further therapy. Each activity should be supported by conducive environment including color concept (see Figure 2).

Therapy would be maximal if the therapy room was not too big, enabling limitation of movement, no glass window that could be distracting. Color composition should make the room relaxing so that the child feels physically and psychologically comfortable and does not feel bored or tensed. The colors that can be used are pastel colors with low intensity, blue or green. Kopacz (2004:54) suggested pastel monochromatic color for therapy room, one color with different gradation. Besides, color combination such as blue-violet-green (*system triangle*) can be used, especially for one on one room.

Table 2  
*Interior Color Concept of One on One Therapy Room*

Characterisrics	Color concept
Difficult to concentrate	Colors that can increase concentration
Sensitive to light (see table 1)	Indirect, low intensity color (pastel)
Room characteristics Safe, quiet, able to increase concentration or attention	Warm color composition with low intensity

Description of interior color concept for one on one therapy room is presented on table 2.

From psychological standpoint, color can be classified into warm and cold color. Warm colors are red, orange, yellow, and adjacent colors, while cold colors are green, blue, violet, and adjacent colors. Warm colors give psychological influences as happy, exciting, and stimulating. Cold colors give psychological influences as peaceful and comforting.

## Conclusion

Important consideration in choosing interior color concept for one on one autism therapy is the child characteristics and ABA method. Therapy room, autistic children characteristics, and ABA method are closely linked. In ABA method, activity in the therapy room has been outlined. By knowing the activities, the atmosphere of room interior that supports therapy process can be ascertained, and appropriate color is applied.

According to Birren (1961) and Pile (1995), colors that can increase concentration are yellow and green, but according to Bonds (2000), it is yellow. But as autistic children are sensitive to light, the colors used should be in low intensity, using monochromatic pastel color with varied gradation. Warm color composition with low intensity is able to support the therapy room, to give safe, comfortable so that the child can concentrate and therapy activity can go well.

## References

- Birren, F. (1961). *Colour psychology and colour therapy*. New York : University Books, Inc.
- Bonds, V.L. (2000). *The Complete Book of Colour Healing*. London: Godsfields Press, Ltd.
- Fadhel, N. (2010). *10 Jenis terapi autism*. Retrieved from: <http://poker008.wordpress.com/2010/10/30/10-jenis-terapi-autisme/>

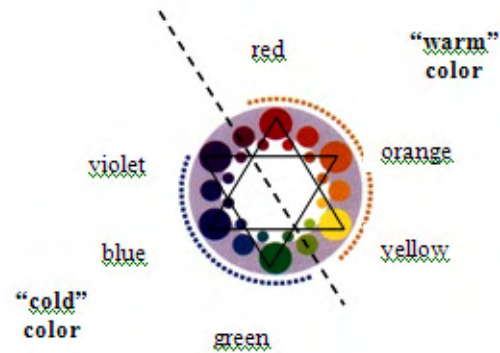


Figure 3. Color scheme

- Handojo, Y. (2003). *Autisma*. Jakarta: PT Bhuana Ilmu Populer.
- Kaplan, R. M., Sallis Jr., James M., & Patterson, T. L. (1993). *Health and human behavior*. New York: Mc. Graw Hill, Inc.
- Kopacz, J. (2004). *Color in three dimensional design*. New York: The McGraw Hill Companies, Inc.
- Kominfo-Newsroom. (2009). *Belum ada survey jumlah penyandang autisme di Indonesia*. Retrieved from: <http://www.depkominfo.go.id/berita/bipnewsroom/belum-ada-survei-jumlah-penyandang-autisme-di-indonesia/>
- Matthews, B. (1994). *Stimulus over selectivity, stimulus generalization, and visual context in adults with autism*. Retrieved from: <http://som.flinders.edu.au/FUSA/disabstud/Topics/DSRS9019/study/sect11/thesisbm/defa>
- Nazir, Moh. 2003. *Metode Penelitian*. Jakarta: Ghalia Indonesia.
- Papanek, V. (1983). *Design for human space*. New York: Van Nostrand Reinhold Company.
- Pauli, D. M. (2004). *Engaging the feeling and will of children with autism through the medium of colour*. Thesis, The University Of Birmingham. Birmingham.
- Peeters, T. (2004). *Autisme*. Jakarta: Dian Rakyat.
- Pile, J. F. (1995). *Interior design*. New York: Harry N. Abrams, Inc.
- Sari, S.M. (2004). Peran warna interior terhadap perkembangan dan pendidikan anak di taman kanak-kanak. *Jurnal Dimensi Interior*, 2(1), 23.
- Sari, S.M. (2006). Konsep desain partisipasi dalam desain interior ruang terapi perilaku anak autis. *Jurnal Dimensi Interior*, 4(2), 91.
- Sari, S.M. (2010). *Implementasi konsep desain partisipasi dalam desain interior ruang terapi perilaku anak dengan menggunakan metode ABA/Lobvass*. Surabaya: Universitas Kristen Petra.
- Sharpe, D.T. (1974). *The psychology of color and design*. Chicago: Nelson-Hall, Inc.