Mechanical Abstracts

- Radiant floor heating to supply primary source of heating (Polyethylene laid in heat emission sheets made)
- Supply air provided by air co. that also cools during warm per.
- Supplemental electric heaters in full baths
- Each room to have separate thermostat.
- Some rooms such as "great room", "entrance foyer" to have several Polyethylene heat tubing to run pt to floor joists
VII  PROJECT No. 3: A SMALL PARK SHELTER

This piece of architecture became the result of the previous year of research in the first psychological experiments. One can say that the form itself is a self-indulgence, but this is wrong. The structural complexity of the design provides evidence for the theoretical study. The following pages evaluate the components or rather elements of the composition. The piece was designed for the Muncie Parks and Recreation. The shelter is scheduled to be constructed during the summer of 1988 from donated materials.

The following pages provide support for the creation of complexity in the shelter.
Plan of a Small Park Shelter
Vertical Column Diversity
- Width of col.
- Horizontal sections
- Material of col.

Detail of connections,
the thin wires connecting to the "massive" column.

Conflicting Angles
- Planes connecting with verticals & horizontals

Diversity of Materials
- Contradiction

Side of detail
- Large vs. small
- Low crown vs. high crown
SOFTENING AT UNTREATED OR TREATED ACRE PANELS
- density of groups
- thickness of each

1. high complexity
2. low complexity

Acute differences

SIDE OF COMPETING MOTIONS:
- small intersecting large
- small intersecting small
- large area seeing large

INCONSISTENCY OF MATERIALS:
- the total variation of diverse materials

Square whole seen first

Ventilating seen 2nd

3 layers of overbuilding
- primary vs. secondary overlaying
Infragratic inconsistencies.
- The "stepwise in increments, "the resilient of a whole" concrete field"

Isolation of a piece.

Loss of pieces.
- This creates a high intellectual construct almost to reconfigure the whole.

Overlaying of pieces with a whole.
- The "beneath the layers, the more complex, the whole, sy, 3 layers vs. 5 layers."
VIII PROJECT No. 4: A PRIVY (conceptual)

This architectural piece was commissioned late into the study. For this reason only sketches of the proposed piece exist. The conceptual thought behind this piece of architecture also exploits the idea of structural complexity. The project is going to be built from "found" materials or from donated materials. This means that the structural complexity can be designed into the piece and the materials only need to be situated or composed in this method. The materials chosen will be secondary to the primary appearance of the forms. The detailing of the piece would be considered the "higher" level of perception. Below are "components" that can influence the creation of complexity. These may be used in the privy design to create the cognitive arousal. The elements can all be seen in the 25 models used during the psychological experiments. This structure is planned to be constructed during the late summer of 1988.
IX  PROJECT No. 5: PSYCHOLOGICAL EXPERIMENT NUMBER 2

This is the direction the theory has lead. The concept behind this experiment is to create a environmental simulation that will be able to predict the behavioral effects of an environmental design. The premise to this study is based on the measuring variables that are used. This means that the questions that are asked of the people need to have a correlation to "real" environmental predictions. This study uses a rating system that lets the people decide if a piece of architecture or a specific environment is preferable. The questions were evolved from the designing of architecture. This is to say that the dependent variables used had something to do with the creation of architecture. These variables are, complexity, beauty, and desirability. Below are the parcel results (see graph) to the first part of the experiment. These results will be correlated against the results of the second part of the experiment. There is also two modes of presentation for each part of the experiment, video and actual.

The results of this experiment will allow the designer to use a specific mode of presentation and ask specific question. This will result in a behavioral analysis of the occupant to the built environment before the actual is even built.

The experiment program follows

-First Part

-25 models presented and specific questions were asked

Questions:

Desirability of a small park shelter

Instructions to subjects:

In this experiment you will judge the desirability of models such as those in front of you. These models represent small park shelters that could accommodate about six people. For example, the shelter could be used for a family picnic or to shade from the sun on a hot day. I will be presenting you one model at a time and I want you to judge the desirability
of each model on a one-to-ten scale, with one being the least desirable and ten being the most desirable. Also, you do not need to use only whole numbers, you can use fractions to rate the shelters. Remember, these models represent small park shelters. Do you have any questions?

-Second Part

-25 pieces of actual built architecture with a similar function
-the questions are similar to the first part.
X  THE DESIGN AND EVALUATION OF AN IDEAL ENVIRONMENT

The result of this study is the development of evaluation criteria for the designing and critiquing of environmental designs. The simple idea is to be able to understand what are the reasons behind the manipulating of forms, geometric or non-geometric. The ideal environment can only be found in the understanding of the occupant of the place. Architecture has become to complex in nature to be a self-indulgent profession. One way to view the nature of architecture or rather environmental design is to see the designing as a nurturing. Meaning the design that being produced has the intent of nurturing the people that "walk" through it. The developing of an environment that nurtures the intellect is not a philosophical idea, but rather a tangible theory. The concept lies in the designing of the forms and the juxtaposition of them. One can view the architect as one who benefits or accelerates the technological processes. Kann once said that the architect was not to worry himself with the building technology, but be concerned with the environment. This does not mean that the architect should not know the building trades, rather he was referring to the technological development. The idea is for the architect designing and technology "catching-up" with his designs.

The theory that this book presented abstractly states that when the optimal arousal level is achieved in architecture, there will be a cognitive "advancement". The thesis narrowed the methods of constructing this to the user complexity. The levels of complexity were increased, i.e. greater amounts of design devices. When applied to particular buildings, the theory was then demonstrated with this level of level of complexity. It was then demonstrated with the theory that the complexity of design devices would affect the user's behavior, and therefore, design devices would influence the user's behavior.
XI  APPENDIX A

a psychological research paper

revised 5-4-88
RESTRICTED ENVIRONMENTAL STIMULATION:

The effect on cognitive functioning

("Sensory Deprivation")

February 14, 1982
The purpose of this paper is to present a thesis that believes there are effects on the human mind, because of a decreased stimulus variation in the environment. Specifically the hypothesis will look at the cognitive effects of the reduced stimulus variation. The hypothesis states that a severe decrease of variation in environmental stimulation can and will cause a "slow-down" of the cognitive processes. (There are obviously emotional, behavioral and physiological effects from "deprivation.") This report is divided into four parts; First, the terminology behind the concept of "sensory deprivation" will be explained. Next, the methodologies will be briefly explained along with the different variables that are used in the experimental conditions to distinguish the different types of "deprivation". The third part will provide the evidence to support the thesis. This support material will look primarily at the human subjects that were used during the 1950's and the latter decade, 1960's. Finally the "Project Head Start" program will be briefly examined to show the results of a high level of variation in environmental stimulation.

TERMINOLOGY

The concept of sensory "deprivation" cannot theoretically exist, because of the physiological makeup of the body. For instance, if one were in a "sound-proof" room, there would not be silence. The subject in the room would "hear" a large amount of sounds that this one body is producing, such as the heart pumping or the stomach churning. For this reason the terminology "deprivation" needs to be revised to a more accurate descriptive term. Specifically the term "environmental frustration" could be used instead of environmental deprivation. The concept of "environmental frustration" would describe the body's inability to perform the necessary tasks at hand. This could be a musical activity or a simple task. But because of the "frustration" is not a direct result of the environment. The "environmental frustration" is a direct result of the body's inability to perform the necessary task.

The methodology of the "environmental frustration" was designed to test several variables. These variables were:

1. "Deprivation" conditions
2. "Sensory Deprivation" conditions
3. The elimination of environmental variations
4. The elimination of sensory stimulation
5. The elimination of certain stimuli
6. The sensory frustration in the absence of rather the production of variability

Kuberski labeled the types of deprivation experiments, sensory deprivation (SD) and perpetual deprivation (PD),
each established according to the different criteria above. SD is based on the simple concept of reducing the intensity of the stimulation as much as possible. This meant that subjects were immobilized and restricted from any tactile contact. PD is based on the idea of providing one type of stimulus with no variation or meaningfulness. This type of deprivation usually had a "masking" noise that never changed and again the subject usually had no tactile contact. Other authors have also labeled this type of deprivation sensory reduction input (SRI).

**METHODOLOGY**

The number of methodologies and conditions used for the creation of the deprivation establishes an almost never ending list. Because of this each investigator's results need to be evaluated separately. The diversity in methods creating the deprivation environment allows for a wide range of tests that were preformed during and after the experiments. Guedfeld (1969) explains four basic premises that each experiment was built upon, which are similar to the requirements for creating the deprivation. Below are the four basic criteria and an abstract description of possible effects:

- reduction of levels of stimulation (research with animals has shown that deprived sensory input for long periods of time can cause irreversible damage to the learning processes)
- reduction of variability (Hunt (1961). Research has found that raising a child in a mundane environment could cause a lower level of intelligence
- social isolation (Goldfarb (1955)). It was found that long periods of social confinement can cause emotional and behavioral disturbances, such as individuals not being able to relate to others)
- confinement (actually can be the result of the three above criteria)

Rossi (1963) describes three basic techniques in the deprivation experiments, which could have hundreds of variations in the physical construct of each:

- Hydrohypodynamic experiment. This is a water-immersion technique, which totally immerses the subject as seen below (Illustration # 1). Goldberger & Holt (1958) primarily began use of this technique.
- Tank-type respirator. This restricted movement of limbs and restricted tactile contact (Illustration # 2). Madelson, Kubzansky, Leiderman, Wexler, & Solomon (1961).
- Isolation room or chamber. (one such technique is the
Manitoba chamber used by Zubek). This method is not as "strict" as others. The rooms or chambers usually have a bed, food, and some kind of toilet. The rooms are dark or lit in such a method so that a "Ganzfeld" environment is produced. The isolation room became the most widely used, because of the ease of construction and the easier methods of running the experiment. Some variations of this condition are seen below (Illustrator # 3&4).

The above methods can be used for either the SD or PD. For the purpose of simplifying support for the hypothesis, only the room or chamber isolation experiments will be discussed. Also, only the evidence from the PD technique will be reviewed. Since information in this defined area is still too vast for this specific theory, only a few of the most predominate investigators will be reviewed.

RESULTS THAT SUPPORT HYPOTHESIS

(most of these experiments included testing on the behavioral and physiological aspects of deprivation as well as the cognitive effects. The results presented will only be concerned with the cognitive effects.)

The first deprivation "lab" experiments began in 1951 under Dr. Hebb cf McGill University. These were not known about until 1953, because the experiments were centered around the concept of "brainwashing" that the Russian and Chinese military was using. To create a more "real" atmosphere for understanding the "brainwashing" techniques, the investigators used the room isolation technique, such as seen in illustration # 3. The results were later published by Dr. Heron.

Heron (1961) gives a summation of the PD experiments conducted by Hebb from 1951 to 1954. As mentioned previously, the method used was the room isolation technique. The subjects had restricted tactile contact and wore translucent goggles. The subjects were also asked to stay in the bed except for times to eat or to use the toilet. The results of the intellectual tests were found not to be as impressive as latter investigators found in their experiments. Heron used seven types of intellectual tests to evaluate the subjects ability at the 12th, 24th, and 48th hour intervals of deprivation and two consecutive days after the experiment was finished. A control group was also given the same tests during the same intervals as the experimental group. The control group was told to be "normal" between the testing periods, while the experimental group underwent PD.

Heron found on six of the seven tests the experimental group was inferior to the control group. The worst
performance appeared on the anagrams and the word making
tests. Heron surprisingly found the mirror drawing test had
no significant difference between the groups. He also found
with the two and three digit arithmetic problems, the
experimental group was inferior to the control group. The
experimental group tended to do better on all seven tests in
the beginning, but after the 24 hour duration interval, the
results were leveling and the subjects did not perform better
on any of the seven tasks between the 24th and 48th hour
deprivation time period. This lead Bexton (1954) to
construct a similar experimental condition, but construct a
new test to find if the results Heron collected were correct.

Bexton used a more subjective approach in testing for
intellectual efficiency. The subjects, fourteen in all, had
to write a paragraph before and after the 48 hours of
deprivation. Bexton found there was a significant difference
in the ability to write after coming out of deprivation. The
subjects were given post-experimental questions about their
experience during the PD. All the subjects reported being
confusion in thoughts, and feelings. Subjects reported they
got into the room believing they were going to be able to
work out some problems they were having in academics but
found that after 24 hours in deprivation their thoughts were
not able to "stay-together"; there was a lack of logical
thought. The idea that 48 hours of perceptual deprivation
would cause a possible "slow-down" lead to several hypotheses
on what would result from a prolonged period of deprivation.
Although Hebb had preformed a prolonged duration of PD on
animals and found the effects can be irreversible, it was not
known what the "limit" of tolerable deprivation was for man
before there would be a significant "slow-down" of cognitive
functions.

Vernon (1963) used an experimental condition similar to
Hebb's and tested subjects for their learning capabilities
during PD. Vernon constructed two experiments, one with a 48
hour duration and another with a 72 hour duration of PD.
Vernon used adjective list to test the cognitive functioning.
Again, there were two groups, the control and the
experimental. Each subject was verbally introduced to a list
of eight words and they had to reproduce the list back to the
investigator, without error. The number of trials was
recorded during each testing period. The test was given at
the 12th, 24th, and 48th hour intervals of deprivation and
two consecutive days after the deprivation. Vernon found
there was a decrease in the experimental group compared to
the control group, the experimental group was worse than
Heron's test results. There was still a problem, which was
the PD group was not creating a significant loss in cognitive
functioning. Vernon developed a more difficult task, which
was to reproduce a list of 15 adjectives rather than eight as
before. Also, the subjects were in the prolonged 72 hour
period of deprivation.

The results of this test were similar to those of the previous test up to the 48 hour period. At the 72 hour period however, the experimental group was considerably worse than the control group, but more importantly was the sharp rise in the number of trials to reproduce the adjective list between 48th to 72th hour interval of PD. Following the completion of the experiment, Vernon began another that was to provide evidence that deprivation had the same effect on learning of a new task. Using the same condition of PD, Vernon tested the "new" learning ability by having the subjects "trace" a double lined star, between the lines, without errors(Illustration # 5). The subject had to perform this task by viewing in a mirror, only. The control and experimental groups were closely matched by their intelligence before beginning the PD experiment, because this test was only performed three times on each of the subjects during the deprivation and not before, as in the previous experiments.

Vernon found after the 24 hour period the control group was doing over 67% better, while the experimental group was doing only 47% better. Beyond the 24 hour period, the results kept favoring the control group, while the experimental group kept declining. The results of both of Vernon's tests suggest the higher level cognitive processes are impaired over a short time of PD, such as 48 to 72 hours. The lack of concentration and ability to maintain though can also be assumed though these results. The significance of these tests was in the comparison to the control group. Since the control group was allowed to lead a normal life, while the experimental group was in PD, allowed for a more clear comparison of effects during restricted environmental stimulation.

The longest prolonged lab deprivation experiments were preformed by Dr. Zubek. Zubek used a condition know as the Manitoba chamber (Illustration # 4), which was surrounded by light creating the "Ganzfeld" effect and a "masking noise" consisting of low level frequencies. Zubek allowed three subjects to stay in the chamber for 14 days and only tested their EEG during the duration of the test. Zubek (1960 & 1962) also ran sensory and perceptual deprivation experiments with a 7-10 day duration period. He found the sensory deprivation did not produce the same effects as the perceptual deprivation technique. He found the PD condition produced more negative effects on the intellect than SD.

Zubek (1962) found that recall and recognition were most impaired of all the tests results. He found the numerical digit span to be impaired, but not a significant amount. Also, the two and three digit arithmetic problems were impaired, but not enough to be significant. These results lead to believe only the higher level cognitive functions are
effected during this duration of PD. The question still stands about what happens during a prolonged stay in PD, such as the 14 day condition of PD, that Zubek conducted without evaluated the cognitive effects. During the extended duration of PD, Zubek reported the attitudes of the subjects were becoming "child-like".

Others have studied the higher level cognitive effects, such as deductive reasoning and divergent thinking. Goldberger and Holt (1958) found after 48 hours of PD the higher levels of cognitive thinking were functioning at a "very slow" rate or not at all. This lead them to believe the extended durations of deprivation would eventually lead to a slower cognitive process.

Through these, more significant, researchers of deprivation, one can postulate about what would happen in an environment were variation in stimulus would not exist or only at very low levels. Kagan (1976) conducted a study of an Indian village in Guatemala. He reported the children were isolated for the first year of life: perceptually isolated. Kagan found that because of this, meaningful speech and thought processes were not appearing until at least one year after speech appears in North American children. Kagan also found the rearing of the children in an isolated area slowed the development of the children intellectually. This simple observation technique has provided evidence explaining the children's development was paced accordingly to variability of the environment. For instance, Kagan found when the environment was "better" the development in the children was relatively the same. This finding and the results of the deprivation experiments can lead one to believe the theory that Schultz (1965) constructed about the brain needing "food" to survive is true.

This theory, referred to as Sensoristasis, is constructed from a physiological understanding of the cortical functioning. Schultz believes the cortical is seeking out a stimulation ("food") so that a certain level can be maintained. The theory revolves around the reticular activating system (RAS). Abstractly stated, this area is were impulses go "up" to the cortex and others go "down" the the muscles. The concept meaning, the RAS requires a constant activity so a certain level can be maintained. The theory of Sensoristasis means there exist a drive for sensory variation. To understand what is meant by drive, Berlyne (1960) suggest there are three types: the drive is an energizing condition that affects the level of activity the drive has the function of making decisions the drive is something that seeks rewards

Schultz explains that their exist an optimal range of sensory variation, which can adapt to low levels. The
The problem of the restricted environment is the lack of variation, which according to Sensoristasis, will slow the cognitive thinking processes.

CONCLUSION

The above research results clearly support the hypothesis of restricted environmental stimulation. The severe restriction of stimulus variability in the environment will produce a "slow-down" of the cognitive processes. To support this argument in a "real" environment, other than Kagan's study in Guatemala, one can look at the studies of the "Project Head Start" (PHS) program. The evidence of these studies will support a theory of increased variation in environmental stimulation contributes to an increase in intellectual performance and cognitive development.

The PHS program began in 1965 under the funding of the U.S. government. The program was to benefit the lower income families. Since this time the concept of the program has become so successful, private organizations have been established. The simple concept of the PHS is to expose the child to a large, diverse, variation of environmental situations. The child develops a "large vocabulary" to build upon, which allows for a stronger cognitive process. The intellectual process is strengthened, so the child is able to quantify "things" faster and better. Mann (1978) explains that the use of PHS for one year will produce gains in intelligence and will also "produce significant gains" in the cognitive development in long-term situations.

Palmer (1978) evaluated, with IQ test, 3,000 children ranging from third to eight grade. He found the test results were significantly higher than expected at that age. Palmer also found that the results of the early intervention, PHS, were not significant until the third grade level. Before this grade level he found that the early intervention was difficult to evaluate with the standardized IQ test, so the intervention was not apparent. Most of the tests being used to evaluate the children's intelligence level have been centered around the standardized tests.

The study of the New Haven project by Seitz (1978) gave evidence to the use of the PHS program. Seitz used a control group from an inner city kindergarten program and the PHS children comprised the experimental group. He found that the experimental group IQ rose significantly over the control group. Again, Seitz did not find the results significant until the third grade level. Both of the studies were longitudinal and terminated at the eight grade level.

The significant results of the PHS provides credibility
the concept of early environmental intervention. Since there was a significant difference in intellectual ability in the children, because of the variability in their environment, one can conclude there needs to be a constant variability of stimulation in the environment. This variability can be provided in several different forms, such as the physical environment (architecture), the social environment, the academia environment, and others related. With the evidence from the deprivation experiments and the PHS program, it becomes apparent the construction of a monotonous environment can cause effects to the intellectual process. The only argument toward the evidence could be in the application of the deprivation experiments, because of the severity in restricted stimulation. The support against this argument is the duration of the experiments, because of the short, concentrated time period the evidence from the experiments could be used for relating to a "real" environmental situation. These results can contribute in understanding what the possible effects of a restricted environment can be, one can support the need in a variability. The PD experiments by Zubek, present the results of a monotonous environmental condition. The use of a non-variation in noise level and the lack of physical movement did cause intellectual "slow-down" after the two days duration. The hypothesis states that when there is an environmental condition that has limited variation or is monotonous, there will be higher level cognitive effects.
APPENDIX

A architectural research paper
revised 4-28-88
two theories:

COMPLEXITY & BEAUTY

A development of a correlation

submitted 11-10-87
The initial objective in the manipulation of the built form, architecture, is to stimulate the cognitive processes. The cognitive or perceiving process needs to become stimulated so that an arousal is produced, which provokes a perceptual awareness about a place. The built form then becomes a perceptual stimulus. This perceptual stimulus produces the environmental awareness that one needs to be nourished by the built form. The cognitive process in this way is believed to be an intellectual thought process, which when aroused does effect the other phenomenon that the body and mind create. The emotional, behavioral, and physiological phenomenon are manipulated according to the nature of the arousal produced by the stimulus presented. There are two theories being presented that are interrelated to one another, with one being directly related to arousal. The first is the theory of complexity, which is the perceptual dissonance within the built environment that will be discussed later. The second theory is actually a more personal interpretation, but is obscurely, if not directly related to complexity. This is the theory of beauty. The theories need to be introduced independently of one another before there can exist any cooperation between them.

Complexity is being presented as the interruptor of the cognitive process or the intellectual stimulus. One must understand complexity as the concept of manipulation that entails creating forms that are not readily identifiable, a diversity in presentation. Also the understanding that the manipulation of the form is not the only method of producing complexity. The additions of various color chromas, texture gradients, lighting intensities and shades, various sounds, varying odors, and illusions can all create the perceptual dissonance that is related to complexity. These factors and others also have influences on the creation of beauty. The theory of beauty is being introduced as the Cartesian philosophers had interpreted. Beauty is to be an intellectual understanding of the presented object. This develops the correlation of the two theories have been explained. This does not mean that one can mathematically categorize beauty as the understanding of complexity can be. The features that contribute to the development of beauty can be typified to an extent. For example, the complex can be inversely related to the conception of beauty. This means that possibly beauty can be quadratically calculated in relationship to the formulation of complexity. The theory of complexity and beauty are directly related in their understanding of the tolerance that is allowed. Before discussing this level of tolerance, or level of understanding, one must first arrange the theories and how the complexity and, adversely, beauty are produced.

Complexity is a multi-faceted or variable representation of an object. This suggests that complexity is perceived
when there is a low level of perceptual dissonance. This dissonance, which produces the arousal of the cognitive process, is produced through numerous variables. Below is an abstract interpretation of the sequence that a subject would produce for a positive arousal.

Stimulus  
(visual)

Complexity variables (perceptual dissonance):

- contradiction
- ambivalence
- ambiguity

Psychological phenomenon produced

Perception  
(object perception --- positive arousal)

Object identification (sequential process):

- edge detection with relationship to angles
- components represented (component recognition)
- organization of components
- object identification

Simplification of objects within whole

Environmental Awareness  
(intellectual response, arousal)  
(is beauty seen at this point?)
Before describing the concept of object identification, the ideology of the object must be presented. The "object" as being referred to within these constructs is a materialistic substance that sets within an environment or rather creates the environment that it is within. This is to say that the object cannot exist unless it has an environment to exist within. Also one must understand that the object is habitable, as will be discussed later. The simplified definition of the object would state that the object is of a "real" substance that is understood individually as being. This means that the object is different for everyone. For example, complexity can be mathematically produced so that most everyone will observe the complication but the question is what are they observing. One might now say that the object either exist or it does not exist; which is a futile question. The statement is not to lead to the insipid question of "What is an object", which can never be answered. The explanation given is only to indicate how the theories see the objects.

The concept of object identification is adapted from Biederman's theory of "recognition-by-components" presented in 1987. Biederman presented that the object, no matter how eccentric or unfamiliar, can be recognized by breaking the whole into simple representable components. These components are then returned into the whole to produce a image that can be recognized because of its comprehension to another learned image. This produces the concept of object identification being recognized through representation, which is evolved from learned experiences. He uses the argument that the 7+2 theory of speech perception can apply to the recognition of components within objects. For example, one usually cannot identify more than seven components of an object; with the tolerance of two. The components are identified as diversity in angle, curves, intersecting planes, etc..., which are represented as more simple geometrical forms. The ideology is one that constructs a theory that states that the overcomplication of an object will not register in the identification of the object, the object identification process is halted. The process outlined above is a sequential process, but is not a "cause and effect" relationship. For example, it does not refer that if a occupant of an environment is stimulated by the built form, they will produce an understanding of the place around them. The method presented is to show the organization of the theory of complexity being directly related to arousing the intellect. The primary determinant to the creating of complexity, is to have a "correctiveness" or "perfection" about the whole form. This means that the organization needs to have a cohesiveness to make a whole. This does not mean that the object needs to be an absolute, but rather needs to have a philosophical theory basis on which it is constructed. This develops the
"correctiveness" needed. This idea of "perfection" is essential because if it is not presented, one could experience a mental "shutdown" of the environment around them. This "shutdown" is not wanted according to Piaget who states that; "human action is essential among "real " objects, because it is what relates them and ultimately brings about the objectivity of reality"(6). Referring to Piaget, one can foresee the need in the relationship of object to subject to allow the subject to acquire materialist reality. This reality can then be translated into an intellectual awareness, which is a form of realism in knowledge that is understood.

The object identification has its beginnings with the Gestaltists. The concept of "sensory organization"(14) allows for the understanding of the incomplete form to become complete through the cognitive process; the perception of the whole. This is found to have a direct relationship to learned experiences that one has accumulated. This means that the complexity and beauty of an object has a direct relationship to the representation of an object. The representation is understood by the learned experiences of perception. That is why, when one refers to complexity and states that perceptual dissonance can produce the arousal, one can more clearly understand how to find the method of producing the aforementioned environmental awareness. The concept of multi-formed objects, which create the positive arousal is formed from the understanding or tolerance that subjects perceive. The convoluted form will create a low dissonance, but the question is, can this low complication be appealing to the intellect. For example, if a pragmatic composition of architecture was presented, which means that the form was conceived only from a problematic program and not from a theoretical bias. Can a theoretical composition that entails the true functionalistic approaches, produce an intellectual environmental awareness? The functionalistic term does not correspond to the formal ideology of functionalism, but rather entails the entire understanding of the realm of the built form. Such as the applications of pragmatic as well as the psychological aspects.

The theory of complexity can be mathematically understood, but the means of achieving this "ideal" complexity can only be philosophically understood. The graph below establishes the diversity that can be created when manipulating the form. One needs to understand each of the levels and the effects that they have on the subjects of the environment.
The understanding of the tolerance would lie at the peak of the curve. The idea is to create a built form which produces this arousal that lies at the peak. The philosophical idea being presented establishes that when one can find this, the correlation between the cognitive arousal and the understanding of beauty can be found. Again, the concept of beauty is not directly related, but is related in such a way that the arousal produced shows that the object's form is pleasing. This can be said to have beauty about the object. On the other hand, one cannot assume that this will be true because there are other elements that affect the processing of beauty, such as color chroma, lighting effects, sounds, etc... Obviously, the complexity is above the ordinary, which allows for little or no intellectual processing. The range of deprivation is another concern that one needs to explain only to understand how this could happen and how to prevent such a phenomenon. This area would produce an intellectual distortion of place in relationship to subject, because of their being no identity or reality within the place; no stimulus found. For example, the isolation tanks that were once popular dealt with this phenomenon. The range beyond the peak is a great concern to understanding how far to manipulate the object before an
intellectual blindness occurs. This "blindness" is a perceptual shutdown, which means that the object has become so convoluted that the subject does not even attempt to represent the object. This is a point in which one could actually discover an overwhelming effect that could cause a confusion. This confusion could become so extreme that the subject becomes disturbed by the presences of the environment. On the other hand, if one finds the range of complexity that creates the wanted arousal, one will find a new phenomenon occurring. This new phenomenon is called the adaptation factor.

The concept of adaptation would take place in relationship to the built form. For example, one may find a tolerance or understandable limit to complexity, but with the aspect of time, the same object becomes ordinary. This means that the level of understanding has been heightened, which brings in a new level of understanding within the environment. This concept can be referred to as the advancement of the environmental awareness. The immediate foreseen problem of this construct adaptation is the question of what level does this tolerance of complexity halt. Below is a representation of the complexity values in relationship to the level of stimulation needed to produce the arousal wanted.

The question that presents itself, is where might this level of adaptation take one if the constant understanding of complexity is rising. One might argue that the level should not be raised, but rather, there needs to be a balance of simplicity in relation to complexity. This argument is
valid, but this does not relate to the advancement of the intellect as would the learned experience of the labyrinthine argument. The more abstract or simple, the objects can produce the relaxation which is within the opposite spectrum of the complexity theory, but is needed to create a balance within certain environments. The ideology of the complexity that produces arousal can be said to have a tension or disrupted expectation factor about the form in relation to the subject. This brings back the conceptual theory of beauty, which is in obscure relation to complexity. The beauty of the object can be seen in its simplicity. One might describe a form as being so simple, that it becomes "pristine", while at the same time, the simplicity becomes mundane. It has been said, that the constant rising of complexity in form could present an end by producing an acidic value rather then positive. The concept of this describes the meaning behind the adaptation theory. The adaptation of the representation of a heterogeneous object would actually take place over an unidentified time span. One can intertwine the theory of adaptation with the theory of balance needed in the built environment. The balance is not to be an equal insertion of complexity and simplicity, but rather an unequal inducement of complexity to the level where the balance of inhabiting is not disturbed. This means that there will always be a line of median understanding (ordinary). Below is the progression that would take place in the combination of the theories.
The adaptation theory could involve the aspect of time or movement in relation to the built environment. The concept of balance involves the use of complexity with the intermediate insertion of simplicity would create the travel aspect. Still, this would cause a need in the raising of complexity or variables of complexity because a repetition cannot be introduced. The repetition would cause a banality to occur which becomes ordinary, or to a severe extent, deprivating. In correlation with the production of complexity, one can attach philosophical variables to the object: the belief that the object produces a vitality. This is not to be interpreted that the object comes to life, or that the object is, in opposite respects, futile. The stimulation from the object produces the vitality that is an energy that the intellectual process produces, because of the complexity within the object. The vitality is a liveliness that the occupant senses from the environment and its formation. This in turn, allows for one to say that the object is no longer futile, but rather vital in the environment; hence, the object is therefore the environment. This becomes a psychological phenomenon that one cannot measure in quantities. This can only be philosophically reasoned because of the understanding of the cognitive stimulation.

Another term that describes the objects that are tolerable or understandable in the higher range of complexity, is novelty. The object the assumes the position of producing a stimulation that arouses the cognitive process is novel. The object can be said to have a fanfare or majestic nature about its presence. This states that the manipulation of the built form is to produce novelty. This novelty is closer related to the beauty of the object than the theory of manipulative complexity. This involves the theory of beauty, because the novelty of the object is more "likeable" than the complexity may be at instances. The perceptual dissonance that is needed to produce the farther ranges of complexity are not required to produce a novelty or beauty. This is because the novelty can also be produced through articles that are personally related to the subject. This allows for the idea of novelty to be closer related to beauty because of the personal interpretations. To refer back to beauty, one sees a personal subjectivity about the ideology of beauty. Even if the beauty is not measurable to the complexity of an object, the characteristics of beauty are understood as being ranged in correlation with the range of tolerance of complexity. Below describes what could happen to beauty in its relationship to complexity.
This is not a judgement on beauty, but rather this is to show an indirect correlation between the two theories. The beauty that is being judged is found within the objects as the "pure" components. This means that the components within the object need to be constructed in a way to achieve the beauty desired. The components within the object are "pure", because they present no articulation or etching of the surfaces. They exist only as simple or abstract materials. The beauty can be seen in an object that can be depriving to the occupant. This is to say, that one would enjoy the presence of the object, but not have enjoyment inhabiting the object. This can also occur at the opposite end of the spectrum, which means that the more complex have more beauty, but present low habitability.
a renovation to a 1920, vintage home
APPENDIX D

a clubhouse for a country club
References


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