Effective Use of Negative Space
in Graphic Design

Graduate Graphic Design Master of Fine Arts Program
School of Design
College of Imaging Arts and Sciences
Rochester Institute of Technology

A Thesis submitted to the Faculty
of the College of Imaging Arts and Sciences
in candidacy for the degree of Master of Fine Arts

Dong Hyun Lee
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Approvals

Effective Use of Negative Space
in Graphic Design

Chief Advisor	**Bruce Ian Meader** Associate Professor, School of Design	Date

Associate Advisor	**Thomas F. Moran** Associate Professor, Center for Multidisciplinary Studies	Date

Associate Advisor	**Lorrie Frear** Assistant Professor, School of Design	Date

Chairperson	**Patti J. Lachance** Associate Professor, School of Design	Date

Dong Hyun Lee	Date

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Situation and Audience

The use of negative space as an element of graphic design began with the European modern art movements of the early 1900s.
A booklet spread by Lester Beall demonstrating this is shown below. Its nascent forms can be seen in the Dada and Constructivist designs of the time, which defied all the rules of conventional typography and communication graphics.

Similar to the way in which typographic variables reveal the hierarchy of information in a message, effective use of negative space provides a flexible way to control visual hierarchy (emphasizing and distinguishing primary, secondary and tertiary information). The function of negative space plays a significant role in contributing to the effective readability of text typography.

Readability is the ease of reading an entire composition of print or a digital application. Among the many elements that help to improve readability, negative space is crucial in communicating messages with typography. This thesis attempts to further define the use of negative space in ways that contribute to improved readability.

The primary audience for this thesis is undergraduate sophomore level graphic design students. The secondary audience is graphic design educators.

This 1934 booklet spread by Lester Beall was produced the year after the Bauhaus ceased in Europe. Beall was comfortable with negative space, broken only by accents of type, graphic elements and primary colors.
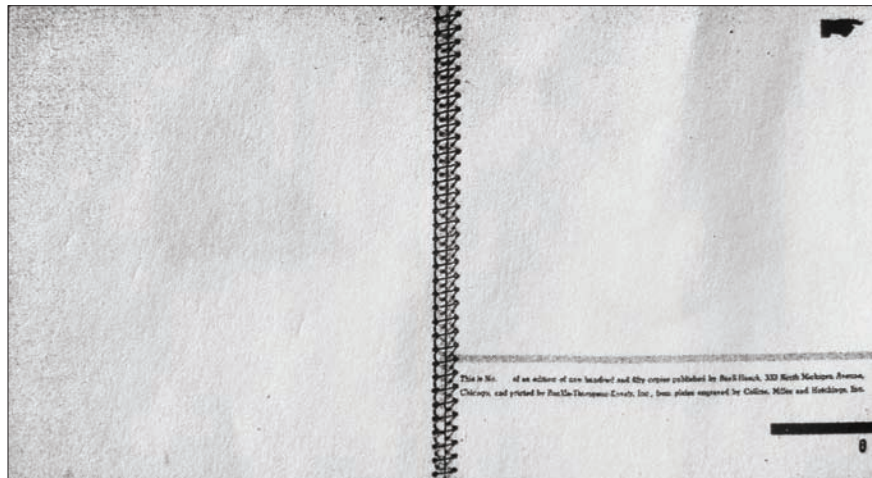
Graphic Design Content

This thesis project focuses on identifying and defining methods of using effective negative space to improve readability in typographic design. From the research and synthesis, a set of guidelines will be developed to help graphic designers better understand the use of negative space and strengthen the readability in their work.

Outside Content

Newspapers and magazines are the most publicly recognized forms print media that present information in a wide range of typographic treatments and uses of negative space. The reader's need and desire is to fully access this information easily and quickly. Therefore, to critically test this thesis hypothesis, the use of negative space in newspapers and magazines will be analyzed. New insights gained from this study will be applied to improve the use of negative space in a reference poster.

Goals and Objectives

This thesis will investigate the potential use of effective negative space to improve the readability of text typography in graphic design. Negative space in two-dimensional design is also referred to as "white space" – which is void of text or graphics. Negative space is more than just the background of a design.

This thesis will demonstrate negative space as an element of design itself and develop a systematic approach to address negative space as it occurs in the following:

- Margins
- Background
- Space for the eye to rest
- Signal that there is a break or end in the communication
- Variation of space – passive vs. dynamic
- Implied space

Rubin, Edgar J.
1886 – 1951
Danish psychologist/
phenomenologist
**Figure-ground
perception**
Rubin Vase

Journal of Cognitive
Neuroscience 13
(2001): 12-18.

" The parts of a visual image may be considered, analyzed, and evaluated as distinct components. The whole of a visual image is greater than the sum of its parts. When confronted by a visual image, we seem to need to separate a dominant shape (a 'figure' with a definite contour) from what our current concerns relegate as 'background' (or 'ground')." An illustration of this is the famous ambiguous figure devised by the Danish psychologist Edgar Rubin.
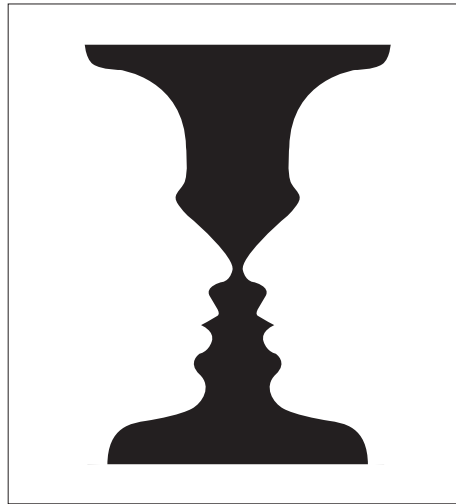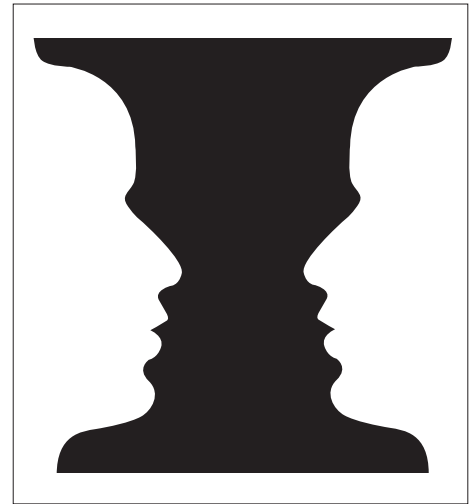
Figure 1   Figure 2

Our innate senses are challenged in such cases as we tend to favor one interpretation over the other. Altering the amount of black or white which is visible can create a bias. When we have identified a figure, the contours seem to belong to it and the figure appears to be in front of the ground. Figure 1 appears to the audience as a vase whereas Figure 2 appears as two faces because of the more negative space used.

Impact

Figure-ground perception as seen in such optical illusions like the *Rubin Vase* is particularly valuable in understanding the relationship between positive and negative space. This example is an excellent and intuitive demonstration showing that both the vase and the two faces could be a negative space. A positive space is always emphasized by the corresponding negative space, thus, the more negative space present the more the emphasis is placed on the positive space.

Moyer, Karen
Associate Professor
Graphic Design
School of Design
Carnegie Mellon
University.
Pittsburgh, PA
**The Typographic
Hierarchy Project
1979**

Graduate Typographic
Design Handouts, 2005.

Typographic Hierarchy
The term hierarchy refers to the vertical system of order, generally ranked by degree of importance. In this context, consider the ranking, not in terms of importance, but in terms of what is *primary*, *secondary* and *tertiary*.

8:00 pm

Carson Auditorium

73 Lomb Memorial Drive

Rochester, New York

Admission Free

Linespace
A simple linespace insertion separates lines of text and groups kinds of information

While we can appreciate the logic of the separations, the resulting groups of text are too similar

Avoid distributing a typographic variable too evenly or too frequently throughout a text

Art and Technology Lectures
presents

Weight
The bolder weight type directly emphasizes a word or line of type

Monday, October 4
The Peculiarity of Pictures

Shift
The shift signals to the reader a distinction is being made among parts of the message

Richard L. Gregory
**Director, Perception Laboratory
Department of Psychology
Cambridge University**

Size
Contrast in sizes of type is a powerful variable to signal distinction among elements, but too many sizes will result in an ambiguous hierarchy

The Intelligent Eye
Thursday, November 24

Thursday
November 24
**The
Intelligent Eye**

Re-ordering text
Isolating parts of the text and experimenting with a few manageable elements is an effective approach to explore new ways to organize the text

" Karen Moyer uses the term *Visualogic* to describe the ideal synthesis of form (visual) and function (logic) – the marriage of beauty and clarity. If the objective is to resolve conflicts between the eye and the intellect, then the better solutions are in the middle of the spectrum between *visual* and *logic*."

Impact   Karen Moyer's typographical hierarchy study influenced this thesis project by emphasizing how to make a message accessible to the reader through the effective use of negative space. Her project illustrates how designers consider the shapes, proportions and variations among elements – both positive typographical components and the surrounding negative space components.

Tinker, Miles A.
Professor Emeritus
Psychology Department
University of Minnesota
Minneapolis, MN
**Spatial Arrangements
of the Printed Page**
Legibility of Print

Ames, IA: Iowa State UP,
1969.
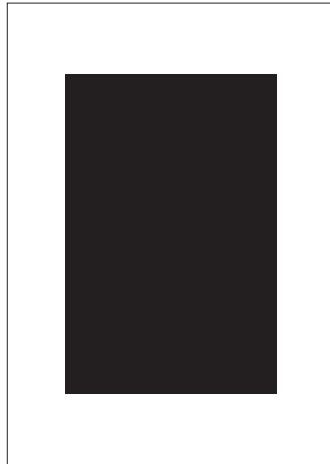
An example of the part-whole proportional illusion: both black and white areas cover about 50% of the page, although visually the black area seems to be larger.

" The results show that the 300 subjects, on average, overestimated the center area in relation to the total card area by 18 percent. It makes no difference whether the central area of the card was black on white or white on black. These results prove the existence of a part-whole proportion illusion. This illusion undoubtedly affects reader judgment about the area of the book page that is taken up by print."

Impact

According to Tinker's study, readers believe 75% of the page shown above is covered by print. This example supports this thesis by revealing that readers' perceptions of surrounding space are that it is often larger than in actuality. Readers generally perceive the printed area to be greater than it actually is, thus, concluding that in order to achieve dominance on a page, size does not necessarily matter, but a balance between positive and negative space must be achieved.

Samara, Timothy
Principal, Samara Lee
Communication
Design, Inc.
**A Graphic Design
Layout Workshop**
*Making and Breaking
the Grid*

Rockport Publishers,
2005.

For designers working in every medium, page layout is arguably the most basic and important of considerations. Effective layout is essential in communicating and enabling the end users to not only be drawn in with innovative design, but to digest information easily. This book is a comprehensive layout design workshop testifying that to effectively break the rules of grid-based design one must first understand those rules and see them applied to a range of professional design solutions.

Impact

As the title implies, the book demonstrates how to successfully interpret and apply the grid system in design. This grid theory will reinforce this thesis with guidance on what grid structures are most appropriate and effective when balancing positive elements (figure) with the proper use and proportion of negative space (ground).

Research Overview

Research began by acquiring and reviewing articles, journals, and websites on negative space and readability. These sources were authored by experts in various fields: Alex W. White, David Epstein, David Kurmann and Miles A. Tinker. In addition, information was gathered through AIGA (American Institute of Graphic Arts), particularly from their *Journal of Design and Communities of Interest*. Through research, relevant theories and principles were reviewed so that they could be used to test aspects of the thesis hypothesis. Though some resources are from different areas outside design, those too were valuable to this thesis because they have impact on the graphic design profession as a whole, and in particular, on the effective use of negative space.

In architecture, the Duality (solid/void principle) provided insight that negative space is no less important than positive elements in architecture and graphic design.

Theories	*Gestalt Theory* (Proximity, Similarity, Closure, Continuation and Figure/Ground)
Principles	*Seven Design Principles* (Contrast, Balance, Unity, Rhythm, Proportion, Movement and Harmony)
From Architecture	*Sculptor: How to Design Space* – David Kurmann
Graphic Design	*The Prominent Void* – David Epstein
	Readability of Mathematical Tables – Miles A. Tinker
	The Elements of Graphic Design Unity and Space – Alex W. White

Epstein, David
Graphic Designer
and Illustrator
Negative Space:
The Prominent Void
Step-by-Step Graphics

Dynamic Graphics, Inc
Sept. 1990: 52-61.
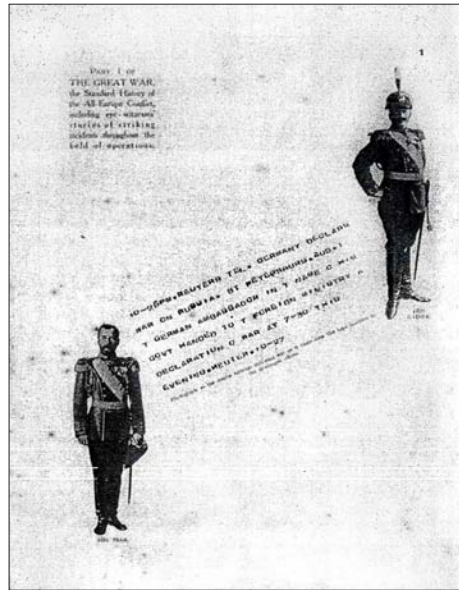
Contrast (direction)
use of negative space

This rare page is part of an otherwise very traditionally designed English book about World War I. The departure from the conservative format of the rest of the book shows the influence of the modern European art movements of the time. Though not finessed, ample negative space at the top and bottom create a strong diagonal movement.
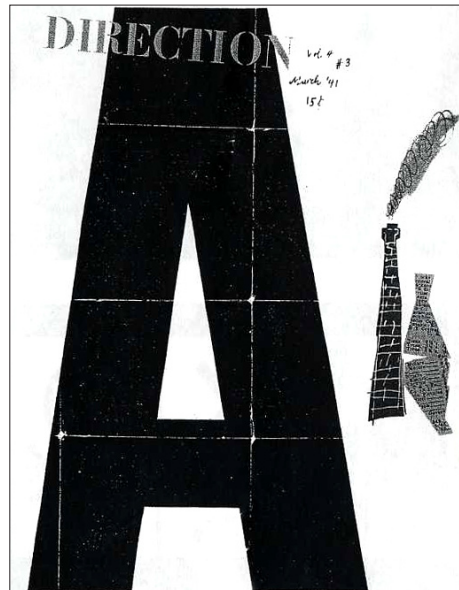
Contrast (size, weight)
use of negative space

This simple magazine cover, designed by Paul Rand in 1941, heralded a decade of dramatic changes in American graphic design during and after World War II.
The massive letterform is anchored by being tangent to the bottom edge. The extreme contrast of size between the large letter A and the small symbols of industry introduces a visual phenomenon where negative space can be seen as flat and also as a space with depth (foreground, background).
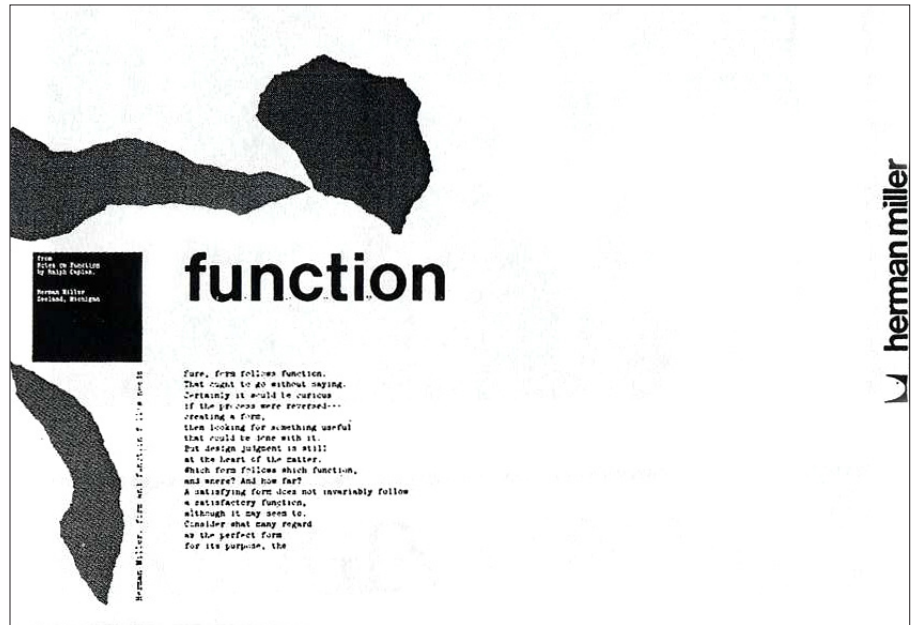
Dynamic,
Asymmetric *use
of negative space*

Part of a series of 1978 designs for a furniture/decorating company, this asymmetrical design is a direct descendent of the Bauhaus style. Clusters of smaller abstract shapes in close proximity are contrasted with massive areas of negative space. This powerful piece doubled as an ad and a poster. (Designer: John Massey)
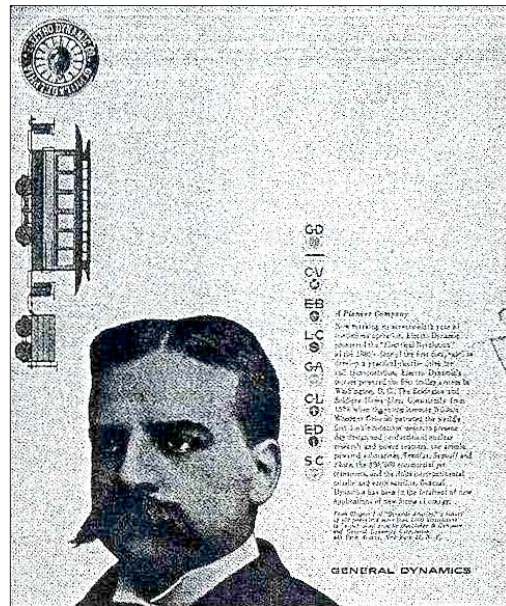
Dynamic,
Asymmetric *use
of negative space*

This dynamic 1959 institutional advertisement for an energy company shows a mastery of asymmetry, scale and negative space. The large triangle of white space in the upper right is contrasted with the mass of the portrait at the bottom of the page. The other positive elements are carefully sized and positioned so as not to disturb this dynamic contrast. (Designer: Erik Nitsche)

REPRODUC-ABILITY™

*. NATURALLY—ON WEB PAPERS FROM CHAMPION
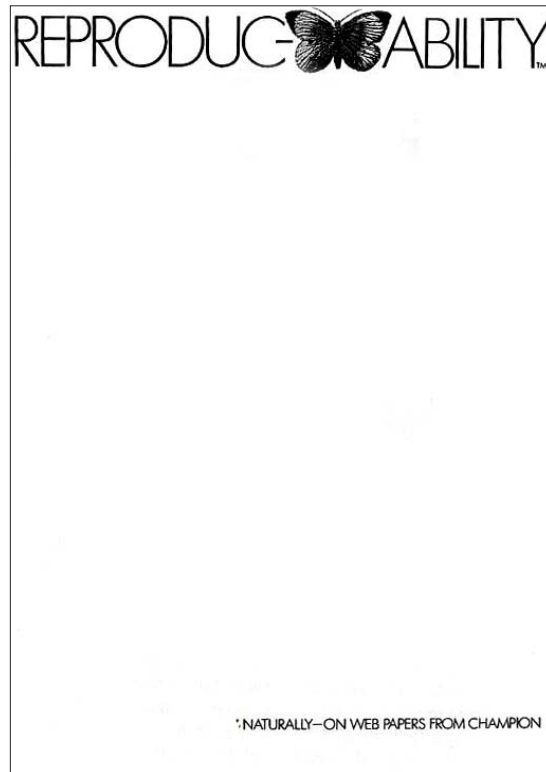
Use of Negative space to focus attention

This 1980 brochure cover for a paper company demonstrates a highly restrained use of negative space. By having the type and illustration hug the top of the page, the huge negative area below becomes a strong, positive presence – a space for the butterfly to fly. (Designer: Neil Shakery)

Impact

The power of these last 3 examples is all about extreme contrasts: small elements or groups of elements in close proximity with small areas of negative space contrasted with large, expansive, open areas of negative space. This gives the compositions a powerful visual tension (because of the big contrasts) and their asymmetry makes them dynamic.

Kurmann, David
Swiss Architecture
Federal Institute of
Technology
**Sculptor – How to
Design Space?**
Space and Material

Scientific American
Oct. 1997: 71-74.

Construction tools enable the modeling of materials. In architecture, however, space might be even more important (Van de Ven, 1987) – a concept not supported by CAD tools. Many architects were and still are proclaiming the importance of space (Boudon, 1977). Through Frank Lloyd Wright, many architects have been influenced by the teaching of Lao Tzu (Chinese Taoist Philosopher, 600 B.C.) that the reality of a hollow object is in the void, not in the walls that define it.

A design tool has to reflect this duality. Therefore, Kurmann proposed to define two kinds of objects – space elements and material elements. They should be treated identically and should behave simultaneously. The void element always carves out space, the solid element adds material. Actually, only an attribute of every object defines whether it is a space object or a material object which is a tremendous help in understanding spatial compositions.

The duality in architecture consists of :

Space	**Material**
Void	Solid
Room	Walls + Roofs
Volume	Boundary
Usable	Buildable
Subtractive	Additive

Impact

As this source illustrates, (negative) space must be considered along with (positive) material in architecture. The same idea can be applied to graphic design because the same human perception process is used in both architecture and print media. In addition, this article allowed Kurmann to think about the way in which both positive and negative space could be subdivided.

Positive space	**Negative space**
Images	Gutters
Text typography	Margins
Headings, Subheadings	Linespacing (leading)
Areas covered by ink	Areas void of ink
(color or tone)	(color or tone)

Kearsley, Greg
Adjunct Professor
Engineering Professional
Development
University of Wisconsin
**Explorations in
Learning & Instruction**
Gestalt Theory

EDIT 704 Mar. 1999.

Gestalt psychology was founded in 1910 by three German psychologists, Max Wertheimer, Kurt Koffka and Wolfgang Köhler. The goal of the Gestalt Principles of Perception suggests that the simpler the visual form, the easier it is to perceive. The theory states that the parts of a visual image may be considered, analyzed, and evaluated as distinct components and the whole of a visual image is different from and greater than the sum of its parts.

Gestalt Theory: Grouping Laws

Proximity
Elements tend to be grouped together according to their nearness.
As the example shows, four circles to the right appear to be in one group whereas two circles to the left appear to be in a separate group of their own. This is due to the fact that a larger gap exists between the two groups than exists between each individual circle.

Similarity
Items similar in some respect tend to be grouped together.
Even though all shapes have the same space in between, four squares form a group and four circles form another group. This phenomenon is caused by elements that are similar in line, shape or form.

Closure
Items are grouped together if they tend to complete some larger entity.
The empty space in the middle of the top row implies a square to complete or close the outer rectangular perimeter. The human mind tends to enclose spaces by completing contours and ignoring gaps between shapes.

Continuation

Items appear to be in a continuation of direction if they align in a linear order.
Three circles appear to be on the same rising line in this example. The human mind tends to perceive continuation in smooth succession rather than abrupt changes in direction.

Figure / Ground

Some objects take a prominent role (the figure – A), while others recede into the background (the ground – B). In both examples, the circle is the figure and the rest of the area within the square is the ground (background), but one is more prominent than the other. This phenomenon is made possible by contrast of the circle to the ground.

A   B

Impact

Both the Gestalt theory and simple readability are based on the tendency of typical human perception. As these principles illustrate (proximity, similarity, closure, continuation and figure/ground), there are a number of areas where visual perception and Gestalt principles support good readability. Both the Gestalt Grouping Laws and Readability approach emphasize that one perceives objects as well-organized patterns rather than as separate component parts. In addition, the "whole" (layout) is something that is more structured and cohesive than separate elements (paragraph).

State of Ohio
Ohio Department of
Administrative Services
**Visual Communication
for Forms Design**
*The Seven Principles
of Design*

Ohio: State Printing
Office, 1998.

Design principles are guidelines. Designers follow principles to develop purposeful compositions. As with an architect's plans, design principles orchestrate the construction of a visual message that is strong enough to support all the graphic elements that will be placed on a blank page. Design principles also help visual communicators forge a link between information content and the structure, so each reinforces the other, communicating a single message. Design principles are cross-disciplinary. The concepts are general and can be applied to any situation where a visual communicator wants to express a message. In this research, design principles are defined in 7 categories :

Seven Design Principles

Contrast
Contrast shows the differences between figure and ground of a design. Contrast can also be used to emphasize a certain element in a design. In the example below, even though the figure shown is the same size in both illustrations, the one on the right appears more dominate (or larger) due to the higher contrast in value to the ground.
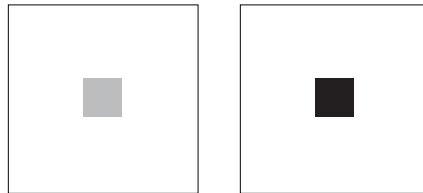
dominant

Balance
Balance refers to the distribution and visual equilibrium of the elements that causes the total image to appear balanced or unbalanced. Balance can be either symmetrical or asymmetrical in a design. Asymmetrical composition is always more dynamic than symmetrical composition because of the visual tension that occurs when the proportions of negative space around the figure vary.
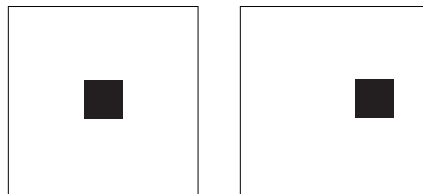
symmetrical   *asymmetrical*

Unity

Unity is a condition or quality of design that is achieved when individual elements or parts are grouped. Unity helps the design to be seen as one unified whole, instead of random, isolated elements in the design.
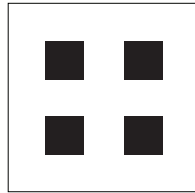
part   *group*
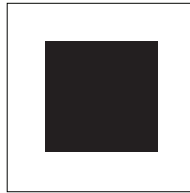
Rhythm

Rhythm is the tempo of visual movement, achieved through repetition of line, shape, or color. Similar to music, rhythm establishes a visual pattern. That pattern can be perceived as busy or repetitive.
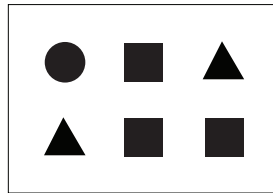
busy   *repetition*
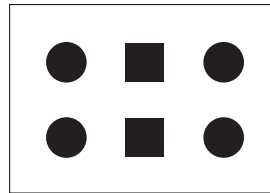
Proportion

Proportion is the relationship of visual elements, one to another and to the whole.
There are 3 kinds of proportion that are regular, irregular and progression.
We consider them particularly in relation to size, shape, color and value.
Differing proportions within a composition can relate to different kinds of balance
or symmetry, and can help establish visual weight and depth. This can create
compositions that range from the static to the dynamic.
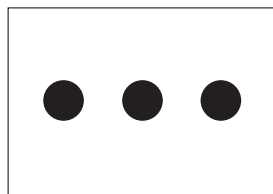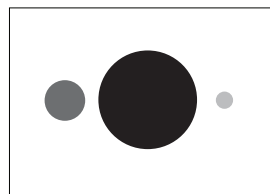
static   *dynamic*

Movement

Visual movements are used by designers to direct viewers through their work, often to focal areas. Such movement can be directed along line edges, shapes, and colors within the composition.
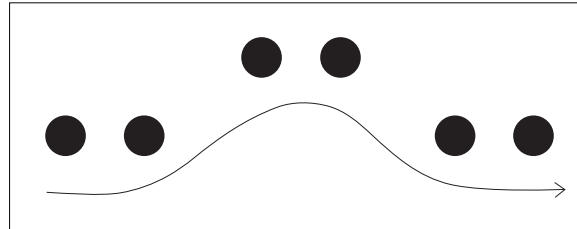
direction

Harmony

Harmony means keeping elements in a state of agreement in which all sections of the pattern make other sections complete. It is the opposite of contrast and implies simplicity of design. Harmony does not interrupt, but allows for smooth even flow.
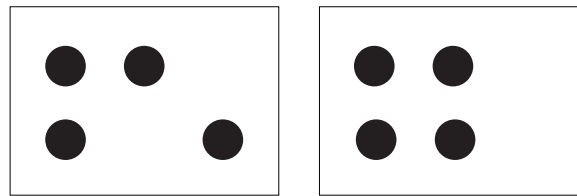
disagreement   *agreement*

Impact

Similar to Gestalt theory, the Seven Principles of Design enable designers to help readers access and comprehend content more effectively. These principles are critical because they not only affect readers but also designers. Through the help of the Seven Principles of Design, effective design solutions can be constructed and implemented in print media layouts, delivering a more successful visual communication.

Tinker, Miles A.
Professor Emeritus
Psychology Department
University of Minnesota
Minneapolis, MN
Readability of
Mathematical Tables

Journal of Applied
Psychology 38 (1954):
436 – 442.

Tinker's landmark 1936 study investigated the reliability and validity of eye-movement research as it applies to reading. One of his primary concerns was whether the artificial situation that necessarily accompanied eye-movement studies conducted in the laboratory caused subjects to alter significantly their reading strategies and processes. Tinker had 57 college students read one version of a reading test at a table away from the eye-movement apparatus, and then the same group read another version of the test while under typical eye-movement recording conditions. The results were encouraging for eye-movement researchers: "Although some subjects did better and some poorer before the camera, the group as a whole gave an entirely typical performance in the photographic situation." Tinker concluded that eye-movement research can reveal reading behavior which allowed research participants to relate their findings to their personal lives and situations outside their work environment.

This investigation involved the design of text and its effect on reading performance. All of the attributes listed below were tested and shown to have a direct association to negative space and how readers related each figure (positive text elements) to the ground (white space).

- Type style
- Margins
- Gutter
- Kerning and letterspacing
- Leading
- Line length / number and width of columns
- Type size
- Paragraph indentation
- Upper and lower case letters
- Justified and unjustified typography
- Ligatures
- Color and background

Impact

Appropriate use of Tinker's findings can lead to designing a clear and concise document that can easily be read and understood. A graphic designer can manipulate typographic variables in such a way that the resting negative space (in conjunction with positive elements) can cause the reader's eye movement to be more efficient, not require as much effort, and therefore, improve the ease of reading.

White, Alex W.
Vice President
Type Director's Club
**The Elements of
Graphic Design**
Unity and Space

Allworth Press, 2002.

A proposal by White promises to reduce the number of typographic elements used and to improve the optical appearance of the design by technical simplification. An original paper was redesigned, resulting in a reduced number of typographic elements, such as line width, type sizes, and leading. By doing so, this allowed the negative space to become a more important part of the design, elevating the overall readability of the piece.
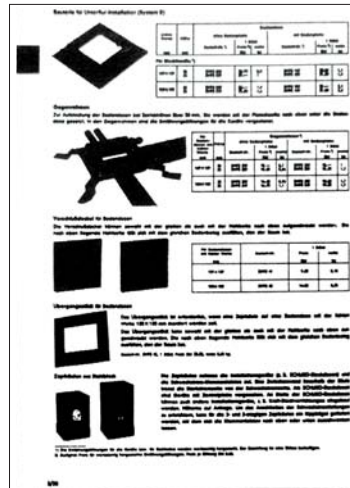
Original design.
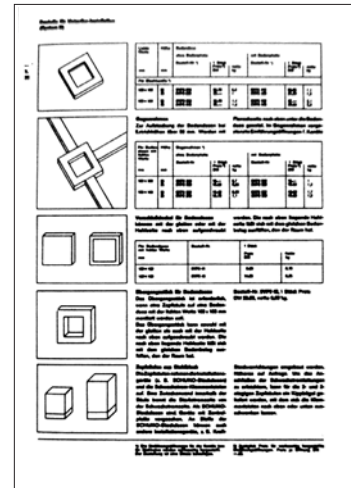
Redesign, with only 2 line lengths.
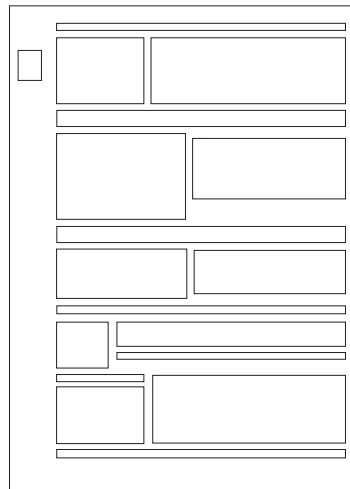
Outline of visual elements,
original design.
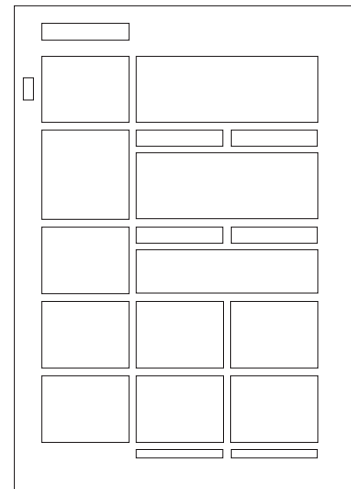
Outline of visual elements,
redesign.

Impact
Efficiency is the key for improved readability and design simplification. To achieve such efficiency, line lengths and spacing units should be kept to a minimum and balanced with appropriate negative space. By doing so, this helps make information and ideas more readable to the reader.

Mahr, Jackson
The Guardian
16 Jun. 2006.
http://www.brand
channel.com/features.
22 Mar. 2006.

In 2004, *The Guardian* announced plans to change to a "Berliner" format. ("Berliner" is a newspaper format with pages normally measuring 470 mm × 315 mm, slightly taller but only marginally wider than the format known as "tabloid") The advantage *The Guardian* saw in the Berliner format was that not only was it easier to be used on public transportation, but its greater height gave them more flexibility in page design. Also, because of the new size, the printing was able to traverse the gutter allowing the paper to run striking double page pictures. New presses also made *The Guardian* the first UK daily paper to print each page in full color.

The format switch was accompanied by a comprehensive redesign of the paper's layout. On Friday, September 9, 2005, the newspaper unveiled its new look and format. Designed by Mark Porter, the new design included a contemporary masthead for the newspaper, its first redesign since 1988. A typeface family called Guardian Egyptian, designed by Paul Barnes and Christian Schwartz, was also created for the new release. No other typeface is used throughout the paper – all stylistic variations.

**American Society
of Magazine Editors
(ASME)**
*2006 National
Magazine Award
Finalists*
17 Mar. 2006.
http://www.magazine.
org/Editorial.
24 Feb. 2007.

The General Excellence category recognizes overall excellence in magazine publishing, honoring the effectiveness with which writing, reporting, editing and design all come together to command the readers' attention and fulfill the magazine's unique editorial mission. The Design category recognizes excellence in magazine design, honoring the effectiveness of overall design, artwork, graphics, and typography in enhancing a magazine's unique mission and personality. The Photography category recognizes excellence in magazine photography, honoring the effectiveness of photography, photojournalism and photo illustration in enhancing a magazine's unique mission and personality.

Impact   *The London Guardian* and *Martha Stewart Living* are considered well organized publications by the general public. The reason for this acceptance is the effective use of negative space in presenting information and figures. Therefore, these are considered more "readable" examples compared to other newspapers and magazines as a whole, and amongst their competition.

Synthesis Overview

To analyze the implication between readability and negative space, two theories were selected. The Gestalt Theory is based on typical human perception. Several principles of visual perception can be used to determine readability using the Gestalt Theory Grouping Laws. Similar to the Gestalt Theory, the Seven Design Principles listed on the next page contribute to helping readers access and comprehend content more efficiently and more effectively. These principles are the basis for good composition, whether for print or digital applications.

After the connections were made, two case studies, comparing newspapers and magazines, were analyzed and evaluated as to their readability and the applicability of the Gestalt Theory and the Seven Design Principles. (pg.11)

The commonalities of definitions and purposes of each theory were examined and parallel theories were synthesized. Within these combined methodologies, five main categories emerged.
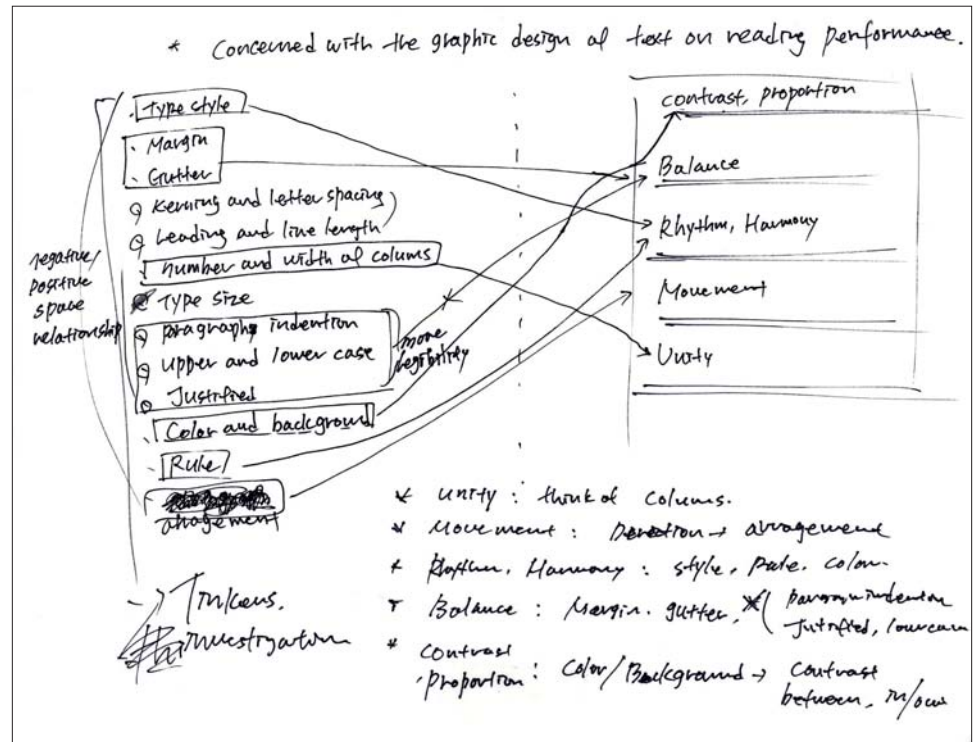
Interrelationship between Tinker's typographic attributes and Seven Design Principles
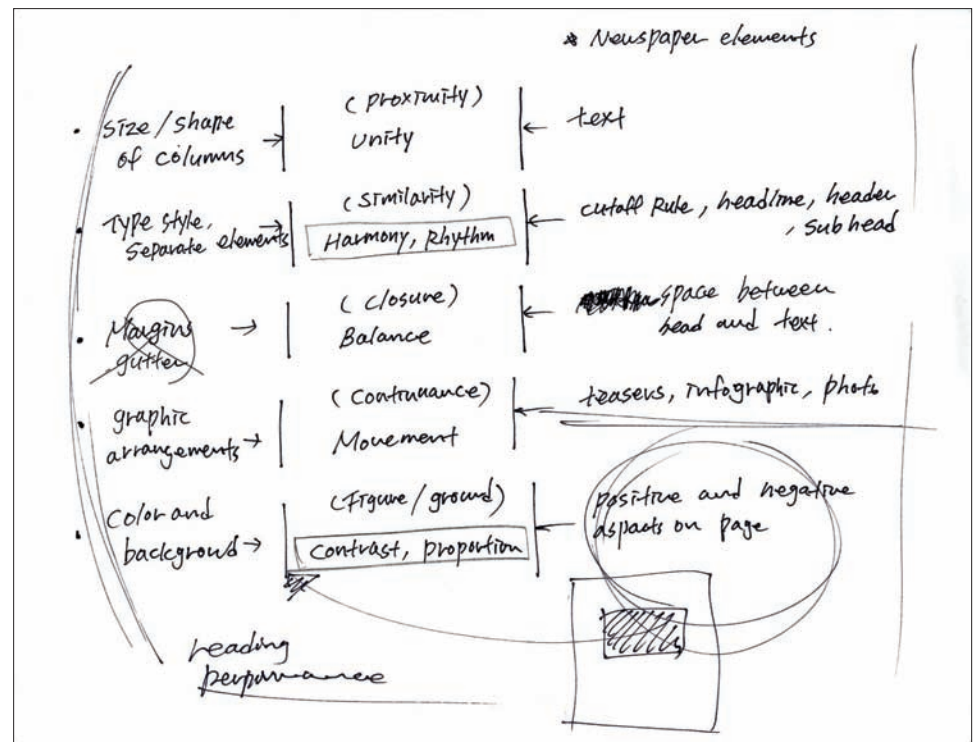
Interrelationship between research findings and typographic elements

The theories and practices of the contributing individuals and organizations found during the research phase of the study were cross-referenced for similarities and connections. The commonalities of definitions and purposes of each theory and principles were identified and color-coded.

Proximity (p11)
Elements tend to be **grouped together according to their nearness.**
As the example shows, four circles to the right appear to be in one group whereas two circles to the left appear to be in a separate group of their own.
This is due to the fact that a larger gap exists between the two groups than exists between each individual circle.

Similarity (p11)
Items similar in some respect tend to be grouped together.
Even though all shapes have the same space in between, four squares form a group and four circles form another group. This phenomenon is caused by elements that are **similar in line, shape or form.**

Closure (p11)
Items are grouped together if they tend to **complete some larger entity.**
The empty space in the middle of the top row implies a square to complete or close the outer rectangular perimeter. The human mind tends to enclose spaces by completing contours and ignoring gaps between shapes.

Continuation (p12)
Items appear to be in a **continuation of direction** if they align in a linear order.
Three circles appear to be on the same rising line in this example. The human mind tends to perceive continuation in smooth succession rather than abrupt changes in direction.

Figure / Ground (p12)
Some objects take a prominent role (the figure – A), while others recede into the background (the ground – B). In both examples, the circle is the figure and the rest of the area within the square is the ground (background), but one is more prominent than the other. This phenomenon is **made possible by contrast** of the circle to the ground.

Contrast (p13)
Contrast shows the **differences between figure and ground** of a design. Contrast can also be used to emphasize a certain element in a design. In the example shown, even though the figure is the same size in both illustrations, the one on the right appears more dominate (or larger) due to the contrast in color to the ground.

Balance (p13)
Balance refers to the distribution and visual equilibrium of the elements that cause the **total image to appear balanced or unbalanced.** Balance can be either **symmetrical or asymmetrical in a design.** Asymmetrical composition is always more dynamic than symmetrical composition.

Unity (p14)
Unity is a condition or quality of design that is achieved when individual elements are grouped. Unity helps the design **to be seen as one unified whole**, instead of random, isolated elements in the design.

Rhythm (p14)
Rhythm is the tempo of visual movement, achieved through **repetition of line, shape, or color.** Similar to music, rhythm establishes a visual pattern.

Proportion (p14)
Proportion is the relationship of visual elements, **one to another and to the whole,** particularly in relation to size, shape, color and value. Differing proportions within a composition can relate to **different kinds of balance or symmetry,** and can help establish visual weight and depth.

Movement (p15)
Visual movements are used by designers **to direct viewers through their work, often to focal areas.** Such movement can be directed along line edges, shapes, and colors within the composition.

Harmony (p15)
Harmony means **keeping elements in a state of agreement** in which all sections of the pattern make other sections complete. It is the opposite of contrast and implies simplicity of design. Harmony does not interrupt, but allows for smooth even flow.

Another major component of the synthesis stage was developing a list of graphic design goals that fall under the main pursuits of negative space. Under each pursuit, a list of readability goals and its corresponding negative space was generated. As shown below, each category within multidisciplinary groups can be connected to each other by their definitions and relevance.

Visual Perception and Organization in Graphic Design

Visual Perception Theories

Gestalt Theory

- Laws of Proximity

- Laws of Similarity

- Laws of Closure

- Laws of Continuation

- Laws of Figure/Ground

Visual Organization Principles

Seven Design Principles
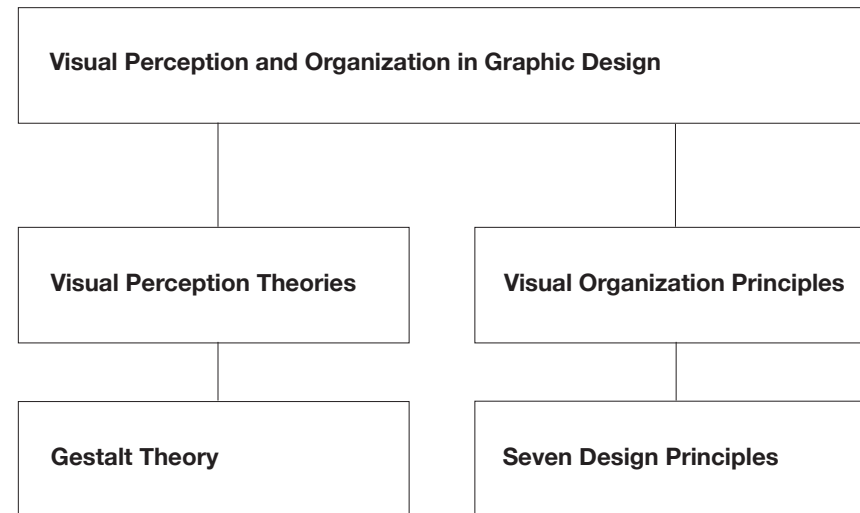
- Unity (part, group)
- Harmony (disagreement, agreement)

- Rhythm (busy, repetition)

- Balance (symmetrical, asymmetrical)
- Proportion (static, dynamic)

- Movement (direction)

- Contrast (passive, dominant)

Visual Elements in Graphic Design

2 Dimensional Space

Negative Space

- Space for the eye to rest

- Signal that there is a break or end in the communication

- Variation of Space (passive vs dynamic)

- Implied Space

- Margins, background

Typographic Components

Readability

- To be seen as one design

- To maintain interest

- To attract attention

- To lead the viewer to the center of interest

- To make important elements stand out

Attributes

- Line length / number and width of columns

- Type style
- Upper / lower case letters
- Justified / Unjustified typography

- Aligned / fluctuating columns

- Paragraph / imagery spacing

- Margins
- Background

Case Study 1

The comparison between *The New York Sun* and *The Guardian* is an example of a dense composition with very little negative space.

The New York Sun

The Guardian

Even though both publications are dense with information, *The Guardian* has less typographic elements and appears more optically balanced, creating more visual negative space vs. the random presentation of *The New York Sun*.

Case Study 2

The comparison between *Country Living* and *Martha Stewart Living* is presented to show an example of a sparse composition with ample negative space.

Country Living

Martha Stewart Living

Even though both publications useing ample negative space in their layout, *Martha Stewart Living* uses a grid system, bringing order, reason and readability to its use of negative space vs. the unorganized clutter presented by *Country Living*.

Elements other than columns have been excluded to demonstrate
the Gestalt Law of *Proximity* and the Design Principle of *Unity/Harmony.*

The New York Sun

The Guardian

Proximity

Even spaces are used to separate main and sub-articles. The articles presented in
The New York Sun are not as clearly divided as in *The Guardian*. *The New York Sun*
example does not clearly denote which article on the page is the lead story, in turn,
adding to its complexity.

Unity/Harmony

Readers may view *The New York Sun* as a unification of one design. In this layout,
text is not arranged in any observable structure; it is simply a mess of columns.
The articles are not as clearly divided by negative space as in *The Guardian*.

Proximity

The main article and sub-articles are clearly defined by negative space.
Different colors for the main and sub-articles have been used to exaggerate this distinction.

Unity/Harmony

The Guardian clearly differentiates the main and sub-articles by using negative space to
separate the two. Due to this clear differentiation, *The Guardian* design provides a more
unified system of parts and a more harmonious, less distracting composition, yielding
a more enjoyable experience to readers.

Elements other than headlines and sub-headlines have been excluded
to demonstrate the Gestalt Law of *Similarity* and the Design Principle of *Rhythm.*
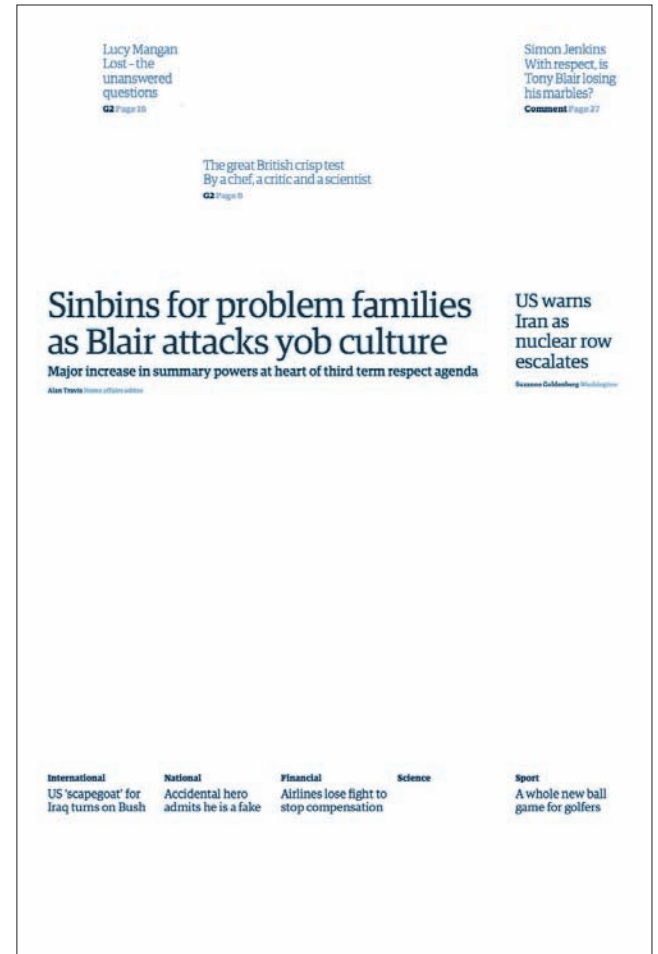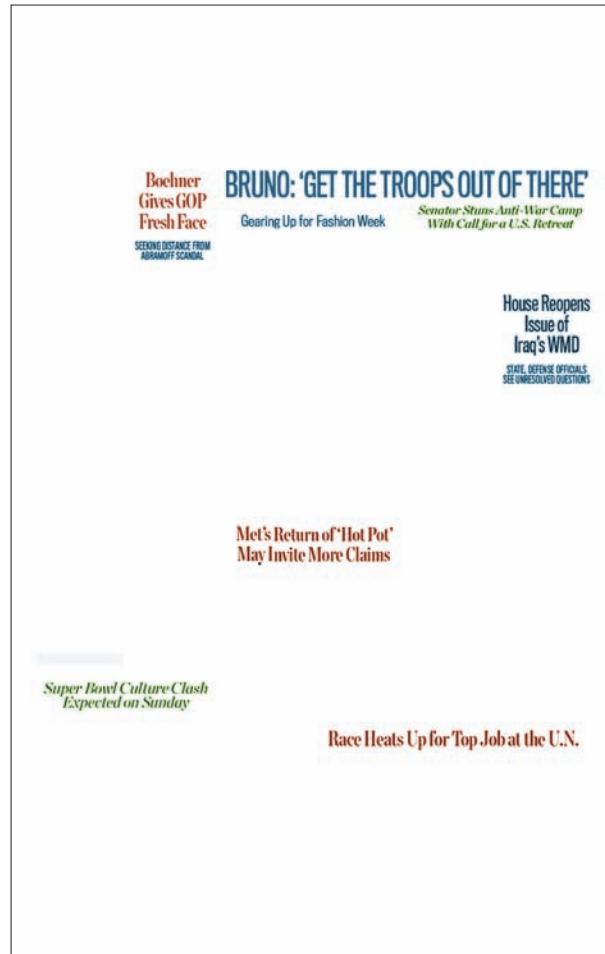
The New York Sun

The Guardian

Similarity

The New York Sun uses three different fonts (color-coded) and uses both caps and lower
case. Heads and sub-heads are horizontally centered to one another but not to each
other, creating random complexity and delivering inefficiency to the reader.

Rhythm

The font styles seem to be randomly chosen, creating a busy, unrelated visual rhythm
from story to story.

Similarity

The same font was used throughout the publication only using variation in size.
In fact, the upper and lower case letters and flush left alignment allow for the reader to
approach each article in a more efficient, consistent way.

Rhythm

The repetition in type style enhances the rhythmic levels and allows the reader to easily
move from one article to another.

Elements other than article body copy have been excluded to demonstrate the Gestalt Law of *Closure* and the Design Principle of *Balance/Proportion*.

The New York Sun

The Guardian

Closure
Fluctuating column lengths are used. The vagueness of the negative space makes the reader's view scattered across the page.

Balance/Proportion
Different length of articles creates a dynamic composition but also creates a busy composition difficult to follow.
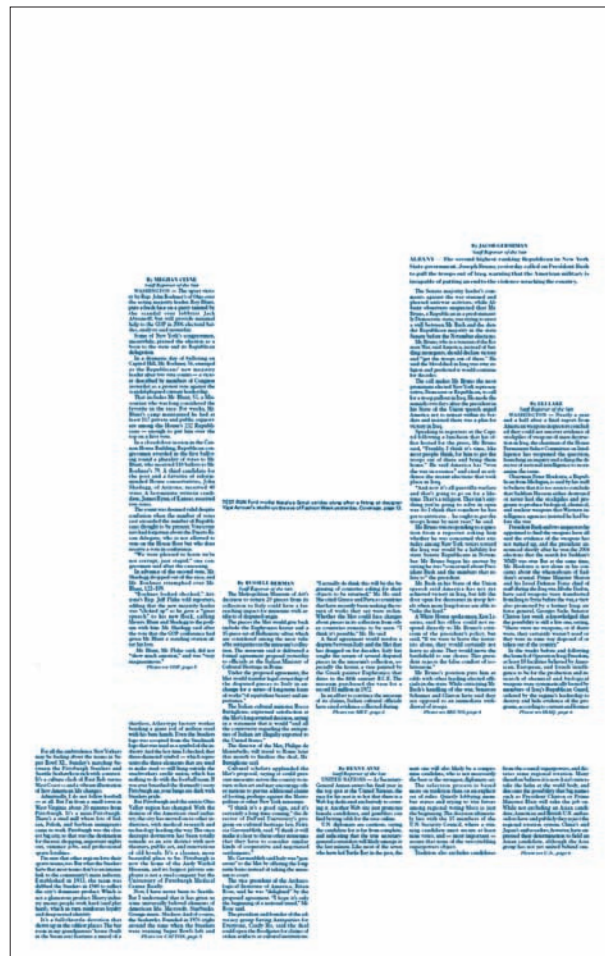
Closure
It is clear that the articles complete strong rectangular shapes. The aligned columns clearly divide each article and help the reader to focus attention on the page.

Balance/Proportion
The similar length and width of the articles express static composition.
However, when the article is reviewed from upper to lower sections, *The Guardian* has an asymmetrical form of composition, delivering ease of reading.
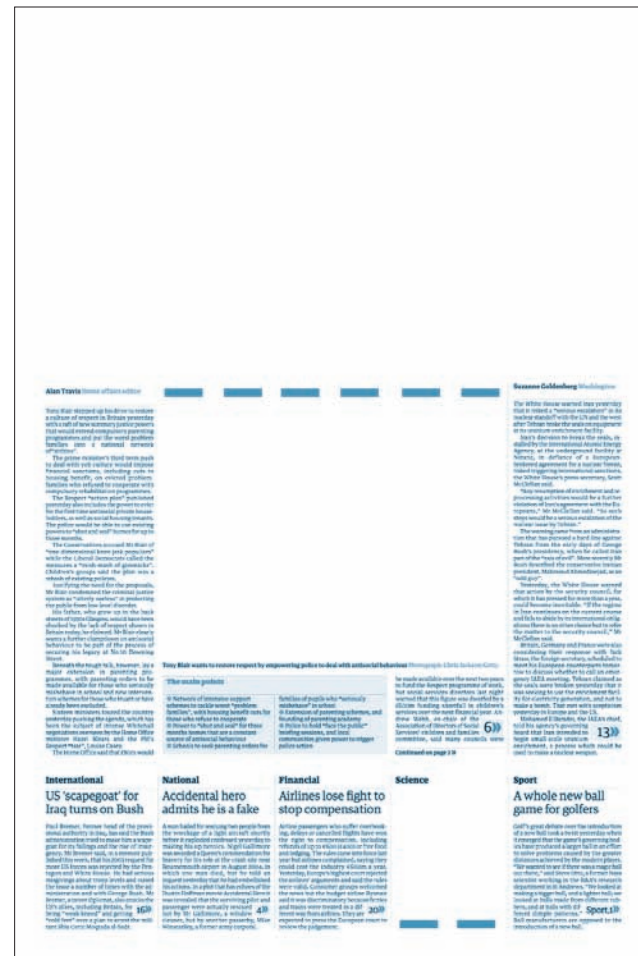
Elements other than graphics and pictures have been excluded to demonstrate
the Gestalt Law of *Continuation* and the Design Principle of *Movement*.

The New York Sun

The Guardian

Continuation
Radical differences in the shape of photos can disturb the eyeflow of the reader and
does not allow the reader to have the continuation and flow of the photos.

Movement
Top to bottom, left to right and right to left reading direction in *The New York Sun* is
random and complex.

Continuation
Photos are relatively similar in shape, allowing the continuation of the photo arrange-
ment and helps the reader to concentrate on the main article.

Movement
Top to bottom, left to right reading direction in *The Guardian* is natural and logical.

Elements other than negative space have been color-coded to demonstrate
the Gestalt Law of *Figure / Ground* and the Design Principle of *Contrast*.

The New York Sun

The Guardian

Figure / Ground

With ambiguous perimeters of the spaces, it is difficult to recognize the important
sections because all figures are tied together and there is an inadequate use of
negative space.

Contrast

The scattered spaces along each article deliver a passive feeling.

Figure / Ground

Spaces are clearly divided and components are positioned in a concise manner.
By doing so, important sections are highlighted.

Contrast

The large negative spaces divide the articles, creating more dominant positive spaces.

All elements are color-coded to demonstrate the Gestalt Law of *Proximity* and the Design Principle of *Unity/Harmony*.

Country Living

Martha Stewart Living

Proximity
Even spaces are used to separate the different text and image elements. It is not clear which text describes which image in *Country Living*.

Proximity
Big spaces are used to separate four groups of text and images. It is clear which text describes which image, thus each column tends to be seen as a separate unit on the page. Different colors (green, blue, orange, purple) for different content were used to emphasize this distinction in *Martha Stewart Living*.

Unity/Harmony
With this even distribution and even use of negative space, there is no unified whole and no sense of continuity.

Unity/Harmony
Intervals of space are smaller among each group of text and images. Larger intervals of negative space allow us to see these groups as separate and as a unified whole.

Elements other than headings have been excluded to demonstrate
the Gestalt Law of *Similarity* and the Design Principle of *Rhythm*.

Country Living

Martha Stewart Living

Similarity

Alternating colors and combined flush left (blue) and flush right (red) text are used
to differentiate text. A single typeface is used but a mixture of flush left and flush right
alignments and all lower case characters present a lack of consistency in headings.

Rhythm

A discordant rhythm results from the mixed use of flush left and right justified text.

Similarity

One typeface is used, only a flush left alignment of text, and a consistent use of
upper and lower case characters. There is also consistency in the headings.

Rhythm

The repetition of the same style of headings, but the position of headings in this spread
are actually more evenly distributed, making the rhythm even and passive.

Elements other than text have been excluded to demonstrate
the Gestalt Law of *Closure* and the Design Principle of *Balance/Proportion*.

Country Living

Martha Stewart Living

Closure
No single column or groups of paragraphs show any relationship to each other
within the composition. The shapes don't aid the reader to follow a specific sequence.

Closure
Aligned columns lead to a simpler composition. The position of each rectangular text
block tends to help the reader follow the correct sequence more easily.

Balance/Proportion
Scattered text components take the form of static balance. They are too evenly
distributed while the proportion of space has some variation, it too is largely static.

Balance/Proportion
The variety of large and small negative spaces yields a more dynamic composition.

Elements other than photos have been excluded to demonstrate
the Gestalt Law of *Continuation* and the Design Principle of *Movement*.

Country Living

Martha Stewart Living

Continuation
Each image in the 2-page spread above has unique outer shape, providing no lines of
continuation across the page.

Movement
The items are clustered randomly together, becoming obstacles for the reader's
reading direction and eye movement.

Continuation
Each image in the 2-page spread of *Martha Stewart Living* shows the continuation
of similar rectangular photo shapes and sizes.

Movement
Photos are clearly organized, thus allowing the continuation of eye movement
across the page.

Elements other than negative space have been color-coded to demonstrate the Gestalt Law of *Figure / Ground* and the Design Principle of *Contrast*.

Country Living

Martha Stewart Living

Figure / Ground
An ambiguous perimeter caused by inadequate negative space leads to trapped spaces with in the composition.

Figure / Ground
Sufficient negative space clearly divides four sections of the content and there are no "trapped spaces".

Contrast
Less contrast between figure and ground yields a busy composition.

Contrast
The figure stands out allowing the ground to stand behind. This helps the reader more easily recognize the positive spaces.

During the synthesis phase, a preliminary conclusion was reached by employing negative space in accordance with the Gestalt Theory and the Seven Design Principles, leading to increased readability when applied to documents.

During this phase, several examples were reviewed, compared, and analyzed: the newspapers, *The London Guardian* versus *The New York Sun* and *the magazines, Martha Stewart Living* versus *Country Living.* Based on the analysis, *The London Guardian* and *Martha Stewart Living* were considered the more readable examples and *The New York Sun* and *Country Living* were considered more complex, and less easy to read. The more readable examples tend to contain the more positive attributes of the theories findings as described below:

With respect to the laws of Proximity and Unity/Harmony, in the more readable examples examined in the synthesis, similar kinds of information were bundled together by minimizing the negative space between them and different kinds of information were clearly separated by increased negative space, leading to ease of reading. In addition, overall unity and harmony were maintained.

With respect to the laws of Similarity and Rhythm, a consistent typeface, and use of upper and lower case typography and flush left text alignments were present in the more readable examples. This establishes a clean border with negative space as well as a coherent rhythm. Therefore, the overall page design was less complicated and a helpful, repetitive rhythm was created.

With respect to the laws of Closure and Balance/Proportion, the more readable examples demonstrate aligned paragraphs and columns which create a less complicated composition. The negative space becomes aligned as well, leading to improved readability. Even though *The New York Sun* is one of the less readable examples, it features an asymmetrical arrangement that reveals more dynamic balance and proportion. It contributes to the attractiveness of the overall page for readers.

With respect to the laws of Continuation and Movement, in the more readable examples, the negative space surrounding the images helps to lead the eye from top to bottom and left to right. These directions are the natural eye movements of a human being. Therefore, readers are less confused as to where the content begins and ends.

With respect to the laws of Figure / Ground and Contrast, in the more readable examples wider and less complicated shapes of negative space divide the figures and allow them to stand out. In addition, these shapes eliminate 'trapped spaces' which reduces distinction between figure and ground. Therefore, an increased contrast between figure and ground is made possible by manipulating the shapes of negative spaces.

The original concept for the final application was to develop a set of guidelines for graphic design students that could be used during the design process to better understand the effective use of negative space. However, this concept was changed to redesigning a reference poster. Among the recommended vehicles to consider for application were textbooks and encyclopedias. However, these vehicles sometimes contained too little text or too much imagery. Finally, the reference poster for redesign was chosen from the Rundel Library on April 20, 2006.

Bruce Algra's Health and Drug Education Series (Harmful Effects of Alcohol & Drugs on the Fetus and Infant)

Before starting the redesign of the reference poster, the five categories outlined in the Synthesis were addressed. The main goal was to see how varying negative space affects the overall composition or layout. Each category was processed to evaluate the negative space.

Ideation sketches
(more sketches can be found in Appendix B)

First, by reducing the size of text and images, more negative space could be obtained. As a result, the images were reduced, but the size contrast between text and image was enhanced.

Figure / Ground and Contrast

In the next step, similar information or content are grouped. As one will see in the example below, *Alcohol, Smoking, Marijuana, Cocaine* are separated from *How Drugs Travel* by a horizontal negative space. The increased negative space makes the separation of information more apparent.

Proximity and Unity / Harmony

The orientation of text, *Harmful Effects* is now top to bottom instead of left to right from the previous example. Now the titles are separated based on the two main categories: Hamful Effects of drugs and How Drugs Travel. To create a simple flow, the image of mother and fetus together are grouped together. Now the direction of images flows more naturally from top to bottom.

Continuation and Movement

By adding typographic rules, the images and text seem to fit better into a rectangular composition. As a result, the vertical negative space, clearly distinguishes the left and right sections. The heading and column alignment provides unity, harmony, good continuation and a stable, balanced composition.

**Closure
and
Balance / Proportion**

In the final poster, a single font, Univers, was used for unity. Typographic variables are limited to two point sizes, all upper and lower case setting, and exclusive flush left, ragged right format. As a result, each paragraph has a similar amount of negative space creating a harmonious, rhythmic visual pattern. Color is used to clarify hierarchy. By doing so, significant information is emphasized without having to de-emphasize the secondary text. This strengthens the similarity of elements in the composition.

Similarity and Rhythm

Thesis Sharing

A presentation describing the overall thesis project, goals, research, and synthesis, was given on February 8, 2006, to a group of Rochester Institute of Technology's Graduate Graphic Design students and faculty members. During the presentation, the meaning of negative space in print media and its importance was discussed. The Rubin Vase example brought up the correlation between positive and negative spaces. Also, the report was folloewd by questions and comments. A peer asked how to develop a design solution that could use negative space to emphasize positive space in a more effective way. This question opened a new line of thinking about the relationship between positive elements and negative space. The feedback from this sharing session included:

- *Some content descriptions required further elaboration*
- *Theory diagrams required clarification*
- *Some people (non-designers) don't see negative space as important or immediately notice it*

Interview

During the early stages of reseach, Kodak Design Center Manager, Rosaline Yin was interviewed. Much of the success of this thesis is related to her input about a basic understanding of negative space. Ms. Yin states:
"Negative space is an important principle of design missing from the page layouts of many novices. White space is nothing. Negative space is the absence of text and graphics. It breaks up text and graphics. It provides visual breathing room for the eye. Add negative space to make a page less cramped, confusing, or overwhelming".

First, the original Algra poster and the redesigned poster were separated into three categories : *Headings*, *Text Type*, and *Images*. By doing so, the ineffective use of negative space in the original Algra poster and improved use of negative space of the final poster are more clearly identified.

Headings   *Text Type*   *Images*

Original poster

Headings   *Text Type*   *Images*

Redesigned poster
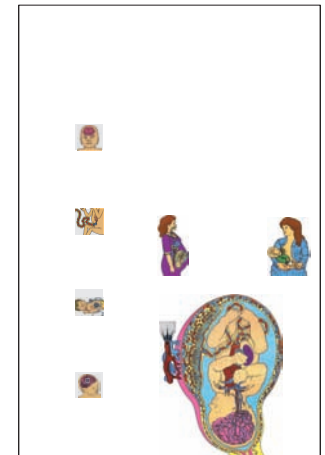
Original poster
Headings
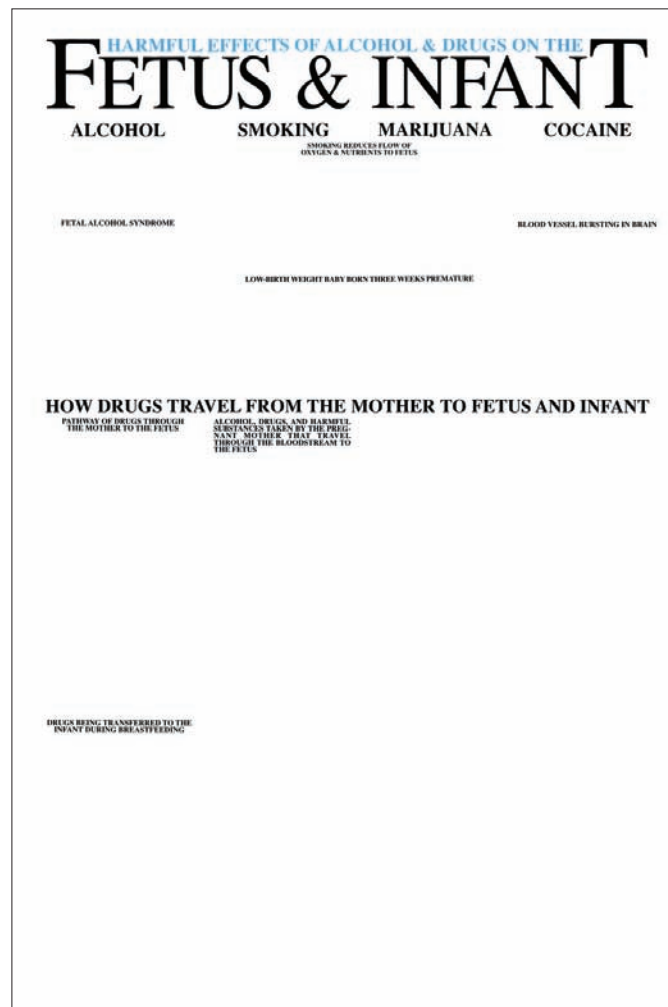
Proximity and Unity/Harmony
Headings and sub-headings spaced too closely together (or placed too far apart) can prove hard to read.

Similarity and Rhythm
The main and sub heading type style is not differentiated from one another so their relationship is not immediately obvious to readers.

Closure and Balance/Proportion
Non-aligned headings make for irregular space between the categories.

Continuance and Movement
The pattern of the subtitles cause the reader's eye flow to be completely blocked.

Figure / Ground and Contrast
The spaces throughout the headings and most of the sub-headings are absorbed toward the top portion of the paper.

Redesigned poster
Headings

Proximity and Unity/Harmony
Based on the differences in saturation (red to gray), information was divided
by importance.

Similarity and Rhythm
The information in the same category (left row) was highlighted with the color red.
In addition, the same vertical interval exists between the rules, thus making a
consistent rhythm. The difference in the point size of the main titles clarifys hierarchy.

Closure and Balance/Proportion
Two rectangular shapes on each side are suggested by the rules applied for
sub-headings. In addition, these bars group each section together. Aligned headlines
also play an effective role in the grouping process.

Continuance and Movement
On the right hand side of the page the headings have different intensity (dark gray to
light gray). The reading direction of the section proceeds from top to bottom. In addition,
the clear distinction between the left and right sections can be easily identified.

Figure / Ground and Contrast
The use of red in the title and 4 primary bars emphasize these
primary pieces of information.

Original poster
Text Type

Proximity and Unity/Harmony
The information contained in the poster does not present itself in a uniform manner. The left portion of the page resembles a grouping of information even though they are unrelated sections.

Similarity and Rhythm
The sub heads and text too closely resemble one another in weight and size, that both visual rhythm and readability non-existent.

Closure and Balance/Proportion
Several of the categories don't seem to have any closure or balance to their visual presentation because of textual units in random arrangement.

Continuance and Movement
Reading direction is difficult to recognize. It is unclear whether to start reading from the left and move to the right or begin at the top and continue to the bottom.

Figure / Ground and Contrast
The information is scattered across the entire poster. Each category is given the same degree of emphasis.

Redesigned poster
Text Type
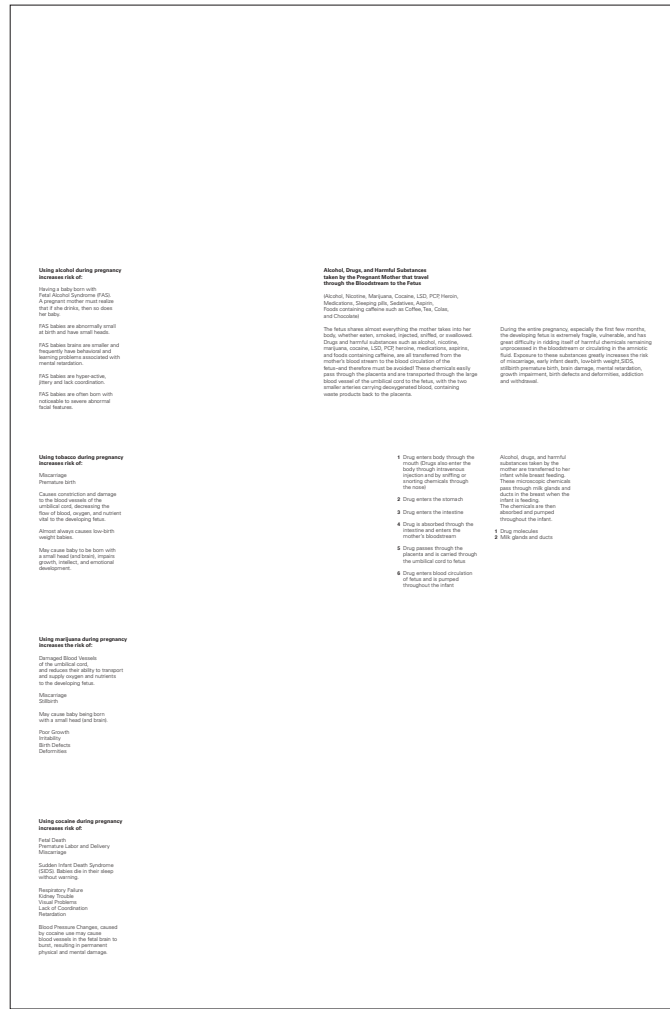
Proximity and Unity/Harmony
Smaller gaps help divide the text into groups of information. Larger gaps exist between the sections to separate the information.

Similarity and Rhythm
Each paragraph starts with bold type (sub-headings) creating consistency among headings. This clarifies hierarchy within each paragraph. To make a less busy composition, one typeface, two type sizes, and flush left text was used throughout the poster.

Closure and Balance/Proportion
Each aligned paragraph implies a rectangular shape. In addition, the asymmetrical formation of the paragraphs lead to a more dynamic composition, creating variation in the proportions of negative space.

Continuance and Movement
The position of the paragraphs from top to bottom and from left to right makes the eye flow naturally through the page.

Figure / Ground and Contrast
The reduced point size leads to an increase in the negative space, thus allowing each paragraph to be given more emphasis.

Original poster
Images
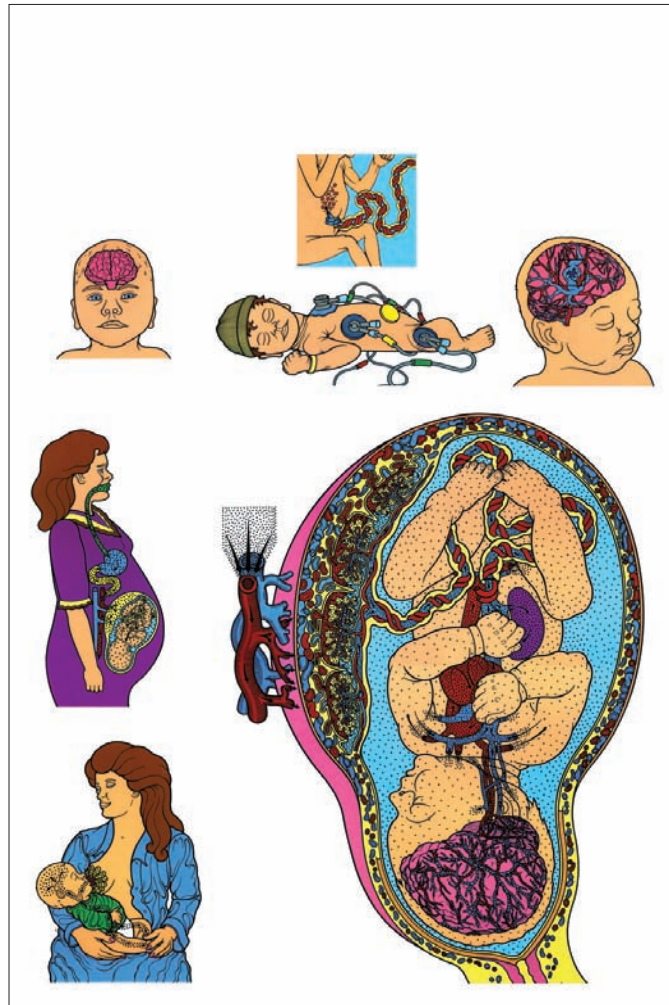
Proximity and Unity/Harmony
Images appear isolated and independent from one another rather than working together because of irregular negative space between them.

Similarity and Rhythm
The four images in the upper area of the poster don't have commonality with each other in shape and size.

Closure and Balance/Proportion
It's difficult to achieve a strong sense of closure or to control dynamic balance when all elements are complex organic shapes with no unifying characteristics.

Continuance and Movement
Oversized images result in a narrow and closed reading direction and no space for visual movement.

Figure / Ground and Contrast
The positive elements and negative spaces are evenly distributed so there is no contrast on the page, making it passive and dull.

Redesigned poster
Images
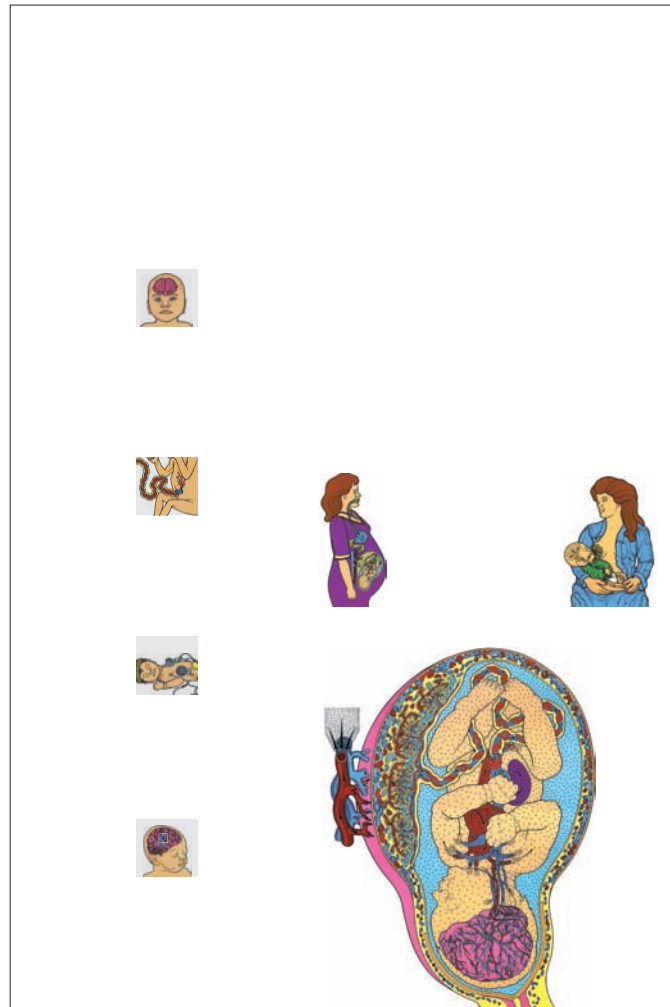
Proximity and Unity/Harmony
In order to promote uniform negative space throughout the page, similar distances were placed between the images.

Similarity and Rhythm
The four images in the left section are the same size with a light grey background. This results in a stronger, more rhythmic similarity.

Closure and Balance/Proportion
The four images on the left side of the page imply a rectangular shape and the three larger graphics also imply a rectangle on the right side of the page. This results in a stronger grouping of images and a more dynamic balance.

Continuance and Movement
A more effective flow throughout the page is made possible by placing images with similar characteristics near one another.

Figure & Ground and Contrast
The size of all images was reduced so there is more negative space on the page, and the proportion between the sizes of images was controlled so that more or less emphasis is placed on the images accordingly.

The following poster is a redesign that demonstrates the effective use of text typography. With a visual hierarchy now in place, the reader is more engaged with the information and more likely to retain its content.

Proximity and Unity/Harmony

Similarity and Rhythm

Closure and Balance/Proportion

Continuance and Movement

Figure & Ground and Contrast

Text typography is separated and divided by negative space. By doing so, the randomness of the original poster was eliminated and the elements are harmoniously integrated. In addition, the beginning and ending of each section is clear.

All typographic elements are set in one typeface with proper variation in size and colors to reveal hierarchy. To create a regular rhythm, the same vertical distance was applied between each heading.

Balance and proportion of the components were adjusted by grouping text and photographs together with their own kind. Each paragraph is seen as a rectangle, making it easier to recognize that there are four important sections.

The order of the components corresponds to the order of their priority. Unlike the original poster, the reading direction is from top to bottom.

The negative space in the original poster was too dense and distracting, thus creating unbalanced positive spaces. Clusters of components are now balanced against large white areas of negative space.

Gallery Exhibition

A work-in-progress thesis exhibit was displayed in the Bevier Gallery, at Rochester Institute of Technology. The display, which describes this thesis project, was on view from April 3 –19, 2006. This panel system was developed to explain the effective use of negative space in graphic design.

The opening night allowed meaningful discourse about aspects of this paradigm with a diverse audience (art and design faculty, students, and professionals). This photograph was taken on the opening night and shows the full installation. Details of each panel can be found in Appendix C.

Thesis Display

Gallery Exhibition

The panels shown below demonstrated the benefits of applying the Gestalt Theory and the Seven Design Principles to use negative space more effectively when redesigning a reference poster.

RIT Web Offset Reference Poster

Existing Reference Poster:
Ineffective Use of Negative Space

Redesign of Reference Poster:
Effective Negative Space

Future Opportunities for Sharing this Thesis

The poster developed as part of this thesis was distributed to committee members and to an outside evaluator. In the future, the poster could be printed actual size (24"×36") and distributed to practicing graphic designers for use in communicating the printing process. Another potential application of this study is a published article on the role of negative space within graphic design. An article could be featured in a communication design journal which would allow the Gestalt Theory and the Seven Design Principles to become an fundamental tool for designers wanting to develop effective design solutions through the intelligent use of negative space.

Self Evaluation

Throughout this thesis process, It was difficult to define negative space as it relates to readability and this designer did not initially have the clearest understanding of this relationship. While there is a general understanding among designers as to what negative space refers to, there is also ambiguity. And though designers use the term easily in conversation, it has so far eluded any formal definition. However, after research and ideation, the definition became clearer and therefore, relevant to the ease of reading.

Final Application Feedback

After several revisions, the *final poster* and *original poster* were sent to Amanda Green, Graphic Designer at Eastman Kodak, for her feedback. May 12, 2006.

These are her written responses

Proximity and Unity/Harmony
The poster demonstrates a proper use of proximity which brings together an overall feeling of unity. The body copy has a more organized and well thought out appeal. The typographic design seems to be more aware of both the negative and positive space. This makes both the beginning and end more clear.

Similarity and Rhythm
The text being set in one typeface is very helpful and makes the design more organized. The consistent typeface throughout the poster allows for a clean appearence and is more enjoyable read. There is rhythm made by the distance between each heading as well as the size of the headings and the overall space throughout the page.

Closure and Balance/Proportion
The poster seems to be a little unbalanced. Amanda feet there was too much negative space. However, the scale of the images is much more effective and in proportion with the other elements.

Continuance and Movement
The flow of the original poster is ineffective. It is like trying to solve a jigsaw puzzle, impossible. The new poster is a continuous read and the movement is obvious and effective. The viewer can clearly read the poster from top to bottom and left to right.

Figure / Ground and Contrast
The poster demonstrates a clear use of negative space in both figure and ground. The images are in a good relationship to the text and margin. Although the scale of the images and legibility of the type in the original poster are missing in the new design, there is a effective use of negative space which brings contrast and a clear sense of hierarchy in the new design that the old design did not have.

This poster is a clear and effective educational tool. It allows the important information to stand out as well as allowing the informational text to be harmonious with the rest of the page. The graphics are effective without being overwhelming which makes it enjoyable to read.

This thesis expanded the definition of terms and principles that determine the effective use of negative space in printed text typography. The project allowed an expanded meaning to grow from an extensive research and study of specific examples across several disciplines. This thesis successfully revealed a connection between the visual aspects of negative space and the principles that govern readability.

Through this work, a correlation was discovered between the Gestalt Theory Grouping Laws and the Seven Design Principles, and a conclusion was formed. Negative space can support readability by providing:

- *a space for the eye to rest; to be seen as a group, divide, or emphasize*
- *a signal to cue the begining and ending of a text or message to maintain interest*
- *a variation of space to attract attention and develop a dynamic composition*
- *an implied space to lead the viewer to the center of interest*

The effective use of negative space is one of the most valuable aspects of design. The areas of negative space allow a viewer's eyes to rest and not be so rushed in contemplating the content. A designer should factor in an ample amount of 'negative space' when designing a layout. Blank, negative space balances the darkness of text. Don't think of such areas as wasted or unused space; rather, regard the whiteness as a design element in and of itself. Properly placed negative space is an essential element graphic design operating on a high level of excellence.

This thesis provides a set of considerations for graphic designers to follow when consciously making decisions about the use of negative space. The strongest outcome of this is demonstrating the benefits of effective negative space use. A less strong of this thesis outcome is the fact that not all theories and principles related to readability guarantee success. There are design situations in which it is difficult to achieve a strong sense of negative space use. The final application of a redesigned poster provides a comparative study that demonstrates the many effective benefits of the intelligent use of negative space.

Alignment	Arrangement or position in a straight line or in parallel lines. Optical alignment is always more important than measurable alignment.
Alphanumeric	Mixture of letters and numbers.
Asymmetrical	A design arrangement in which the space is unequally divided.
Balance	The arrangement of various elements on a page or spread such that the weight of the various elements is equal.
Baseline	Invisible line on which letterforms sit.
Bleed	Imagery or letterforms that are tangent to the trimmed edge of a page.
Block	Units of text space (paragraphs).
Body copy	The primary text of a story. Usually identified by a medium weight and body size of 8 to 12 points. Does not include headlines, subheads, cut lines, or captions.
Body type	Type used in the text, as distinguished from display type.
Border	A rule used to form a box or to contain an image.
Callout	Wording placed outside the illustration but attached by a line or arrow to that part of the illustration it describes.
Caption	A short descriptive block of copy or a phrase that describes an illustration.
Centered	Alignment in which the midpoints of each element are positioned on a central axis. The left and right edges of such a column are mirror images.
Column	An area on a page defined by a specific width and depth. All columns on a page may or may not have the same specifications.
Congeniality	Emotional connotation or *atmosphere-value* of type.

Contents	A listing of the subject matter and its location in a document.
Contrast	A feeling of variety without the loss of harmony in a design. The difference between one tonal value or another that defines each as a distinct unit.
Counter	The space, either completely or only partially closed, in letterforms such as a, e, o, u, and A, B, C, S.
Deck	A sub-head appearing just beneath or near the headline.
Decorative font	An ornate typeface that would not be appropriate for prose text.
Display type	Type used for headlines, pull quotes, subheads, captions, and all other expressive words, as distinguished from *body type* used for text.
Dropout	Type appearing in white on black or a pale color against a dark colored background. Also called *reverse.*
Duotone	A halftone photographic reproduction printed in two colors, one of which is usually black.
Element	Any unit that makes up a page design. ex. copy, headline, subhead, art, rule, border, image, color tint block, caption, blurb, cutline, folio line, etc.
Flag	The name of a magazine or newsletter*;* also called a nameplate.
Flush-left, Flush-right	Even or aligned on the left edge or the right edge of the column, the opposite side remaining deliberately uneven.
Format	The makeup of a publication – its size, shape, typography, margins, binding, headline handling, etc.
Gestalt theory	The Gestalt theory emphasizes that we perceive objects as well-organized patterns rather than separate component parts. According to this approach, when we open our eyes we do not see fractional elements in disorder. Instead, we notice larger areas with defined shapes and patterns. The "whole" that we see is something that is more structured and cohesive than a group of separate elements.

Grid	The underlying pattern of lines forming the framework of a page; also, to align elements on a page.
Grouping	Arranging pictures so that there is a leader, or focal point, and followers.
Gutter	The inner space between two facing pages. Crossing it by running an element from one page onto the facing page is called *jumping the gutter.*
Header	Recurring copy at the top of the page that helps orient the reader. It can includes such information as title, issue date, and page number.
Headline	Prominent display type, intend to summarize the copy and attract attention.
Head Margin	The white space at the top of a page.
Indent	A notch cut in usually from left-hand edge of a book of type, but also possible from the right or both edges. A paragraph indent appears in first line of each paragraph (though it should not do so in the first one). A hanging indent cuts in all except the first line, which is flush left. A runaround indent parallels the edge of a neighboring illustration.
Justified	Aligning left and right edges of a column of type for traditional neatness. Don't justify with fewer than eight words (forty characters) per line to avoid force-justifying or "opening up" by word-spacing or, worse, character-spacing and thus jeopardizing smooth, rhythmic reading.
Kerning	Removing space between specific letter pairs in order to achieve optically consistent letterspacing.
Layout	The placement of art and text on a page or two-page spread.
Legibility	The ease with which one can identify letters and words in lines of copy.
Linespacing	The spacing between the bottoms of the descenders and the tops of the ascenders in lines of type. Also known as leading.

Margins	The space between elements on a page or spread.
Masthead	An alternate name for the nameplate of a newspaper.
Negative Space	The opposite of positive space, which is space actually occupied by forms in visual elements. Called white space, in letter forms, or counterspace, it's the part of the design that 'isn't' there.
Optical Center	A spot two-fifths down from the top of the page and equidistant from the sides of the live area. This is where the eye will seek to *balance* the page elements rather than at the exact, mechanical center.
Pica	A unit of measurement. There are approximately 6 picas to an inch. One pica is 12 points.
Ragged	Multiple lines of type set with either the left or right edge uneven. Word spacing is constant in ragged setting (flush left or flush right).
Readability	The quality of written language that makes it easy to read and understand.
Sinkage	Area of white space at the top of pages created by unusually deep head margin.
Symmetrical balance	Occurs when all elements are balanced down the middle of a page or spread, either horizontally or vertically.
Weight	The boldness of type, based on the thickness of its characters.

Books

Book, Albert C.
Fundamentals of Copy & Layout
McGraw-Hill Press, 1997

It offers concise information that leads one through the copy and layout process for advertisements in newspapers, consumer magazines, direct response, television, radio, and interactive media.

White, Alexander W.
Elements of Graphic Design: Space, Unity, Page Architecture, and Type
Allworth Press, 2002

This book offers a method for successful designs for maximum reader comprehension. He demonstrates how to use scale, color, and position to guide the eye through levels of importance. Other concepts include employing white space, using display and text type, and defining dominance in images and text.

Swanson**,** Gunnar
Graphic Design and Reading: Explorations of an Uneasy Relationship
Watson-Guptill Publications, 2000

The essays offer explanations of traditions of typography as reading aids, as well as radical interventions that are attacks on or improvements on established reading patterns.

Tschichold, Jan
The New Typography: (Weimar and Now: German Cultural Criticism)
CA: California State UP, 1998

First published in 1928 in Germany and out of print for many years, this text has been recognized as one of the most important statements of modern typographical design.

Carmichael, Leonald
Reading and Visual Fatigue
Greenwood Press, 1972

Visual fatigue during long periods of reading book print and microfilm was studied using blink frequency and eye-movement measures.

Books

Wertheimer, Michael
Max Wertheimer & Gestalt Theory
Transaction Publishers, 2004

Gestalt theory allows communicators to predict how viewers will respond to design elements. This book briefly illustrates the nine Gestalt principles and evaluates how they are applied to create effective figures in textbooks.

Tinker, Miles A.
How to Make Type Readable
Harpers Press, 1974

Results of 12 years of research on readability of print as measured by speed-of-reading tests are summarized. Special arrangements of the printed page, including size of full pages, margins, single versus double column composition, inter-columnar space and rules, and paragraph arrangement.

Samara, Timothy
Making and Breaking the Grid: A Graphic Design Layout Workshop
Rockport Publishers, 2005

This book begins with an exposition of basic kinds of grids, illustrating and defining the most common ones used in traditional design work. A selection of relevant projects shows how these grids organize information appropriate to each application and can provide a framework for composition.

Wong, Wucius
Principles of Form and Design
Wiley Press, 1993

This book gives readers the content of three important references by one of today's most influential design writers. This is a class in the principles and practical fundamentals of design that will appeal to a broad audience of graphic artists and designers.

Journal Article

Berger, Charles
**'Stoke-width, Form and Horizontal Spacing of Numerals
as Determinants of the Threshold of Recognition'**
Journal of Applied Psychology 28 (1944): 208 – 231

The effect of certain typographical variations upon the threshold
of recognition of numerals.

Bonsiepe, Gui
'A Method of Quantifying Order in Typographic Design'
Journal of Typographic Research 2 (1968): 203 – 220

A journal for research on the design unit of simplification.

Strizver, Ilene
'Spacing and Kerning'
AIGA Journal of Typography (2004)

Explains what makes a typeface look the way it does.

Miller, Lawrence M.
'Do The White Thing'
Journal of Essentials 17 (1991): 48 – 50

Describes white space as a design tool.

Tinker, Miles A.
'Reader Preferences and Typography'
Journal of Applied Psychology 26 (1942): 38 – 40

To determine the extent of agreement between judged legibility
and judged pleasingness were compared.

Tinker**,** Miles A.
'Criteria for Determining the Readability of Typefaces'
Journal of Educational Psychology 36 (1946): 453 – 460

Visibility, perceptibility at a distance, and speed of reading
were compared.

Web Sites

Anthony Inciong. **'Models of Character'**
July 15, 2005 <http://www.designforum.aiga.org/content.> 21 Jun. 2005

A assertion of the personal as essential to design innovation and the development
of a strong character among students.

Joshua David McClurg-Genevese. **'The Principles of Design'**
Jun 13, 2005 <http://www.digital-web.com/articles/principles_of_design.> 9 Oct. 2005

This is a concise explanation of the core elements and principles of visual design.

Mads Soegaard. **'Gestalt Principles of Form Perception'**
March 1, 2003 <http://www.interaction-design.org/encyclopedia/gestalt_prin-
ciples_of_form_perception.html.> 11 Oct. 2005

By using the illustrations the author emphasizes his points and shows how the
Gestalt Theories can be used in everyday graphic design.

Paul Shaw. **'The Digital Past: When Typefaces Were Experimental'**
May 19, 2005 <http://www.designforum.aiga.org/content.> 29 Nov. 2005

Shaw recalls those thrilling days of digital type founding and draws some
surprising conclusions.

Index

Effective Use of *Negative Space*
in Graphic Design

**Effective Use of Negative Space
in Graphic Design**

Dong Hyun Lee

Table of Contents

Thesis Committee Members

Chief Advisor

Bruce Ian Meader
Associate Professor, Graphic Design
College of Imaging Arts and Sciences

Associate Advisor

Thomas F. Moran
Associate Professor, Center for Multidisciplinary Studies
College of Applied Science and Technology

Associate Advisor

Lorrie Frear
Assistant Professor, Graphic Design
College of Imaging Arts and Sciences

Designer

Dong Hyun Lee
Candidate for Master of Fine Arts in Graphic Design
College of Imaging Arts and Sciences

Thesis Proposal

Problem Statement

Investigating effective readability of text is an important factor contributing to the development of a functional typography. Readability is the ease of reading an entire composition for print or digital application. Among the many elements that help to improve readability, negative space is crucial in communicating messages with typography. This thesis will expand the definition of terms and principles that determine the effective uses of negative space in printed text typography.

Documentation of Need

The importance of this study for me is to determine the interaction between negative space and readability. The outcome of this thesis will provide methods of using effective negative space and understanding readability in typographic design. The importance of this thesis to society is to help graphic design students and practitioners develop the most effective solutions to improve readability.

Situation Analysis

The primary audience is graphic design educators. The secondary audience will be undergraduate sophomore level graphic design students. This thesis attempts to improve readability for experienced readers who have college-level reading ability.

Mission and Goal/ Objectives

This thesis will investigate what can be done to improve readability relating to negative space and to develop systematic approaches to handling text typography to enhance readability. This thesis will result in a definition of negative space to develop a better understanding of the use of negative space, and identify attributes and considerations of readability.

Processes and Strategies

This research will categorize and compare existing theories of readability.
In addition, this research will find the negative space arrangement that best facilitates readability, and find such typographic elements that enhance reader attention and response. This research will include reviewing relevant literature and conducting interviews with educators and graphic designers involved in typography.

Possible Applications

- Student guidebook on typographic readability.
- Web site for effective use of negative space on web screens.
- Poster or poster series demonstrating effective negative space.

Precedents

" The parts of a visual image may be considered, analyzed, and evaluated as distinct components. The whole of a visual image is greater than the sum of its parts. When confronted by a visual image, we seem to need to separate a dominant shape (a 'figure' with a definite contour) from what our current concerns relegate to 'background' (or 'ground')." An illustration of this is the famous ambiguous figure devised by the Danish psychologist Edgar Rubin.

Perceptual set operates in such cases and we tend to favor one interpretation over the other. Altering the amount of black or white which is visible can create a bias. When we have identified a figure, the contours seem to belong to it, and it appears to be in front of the ground.

Impact   Figure-ground perception as seen in such optical illusions like the *Rubin Vase* is particularly valuable to understand relationship between positive and negative space. They are an excellent and intuitive demonstration that both the vase and two faces could be a negative space. In addition, a positive space is always emphasized by a negative space.

Moyer, Karen.
Associate Professor
Graphic Design
School of Design
Carnegie Mellon
University.
Pittsburgh, PA
**The Typographic
Hierarchy project
in 1979**

Graduate Typographic
Design Handouts, 2005.

Hierarchy
The term hierarchy refers to the vertical system of order, generally ranked by degree of importance. In this context, consider the ranking, not in terms of importance, but in terms of what is *primary*, *secondary* and *tertiary*.

8:00 pm

Carson Auditorium

73 Lomb Memorial Drive

Rochester, New York

Admission Free

Lines pace
A simple linespace insertion separates lines of text and groups kinds of information

While we can appreciate the logic of the separations, the resulting groups of text are too similar

Avoid distributing a typographic variable too evenly or frequently throughout a text

Art and Technology Lectures
presents

Weight
The bolder weight type directly emphasizes a word or line of type

Monday, October 4
The Peculiarity of Pictures

Shift
The shift signals to the reader a distinction is being made among various information

Richard L. Gregory
**Director, Perception Laboratory
Department of Psychology
Cambridge University**

Size
Contrast in sizes of type is a powerful variable to signal distinction among elements but too many sizes will result in an ambiguous hierarchy

The Intelligent Eye
Thursday, November 24

Thursday
November 24
**The
Intelligent Eye**

Re-ordering text
Isolating parts of the text and experimenting with a few manageable elements is an effective approach to explore new ways to organize the text

" Karen Moyer uses the term *Visualogic* to describe the ideal synthesis of form (visual) and function (logic) – the marriage of beauty and clarity. If the objective is to resolve conflicts between the eye and the intellect, then the better solutions are in the middle of the spectrum between *visual* and *logic*."

Impact   Karen Moyer's typographic hierarchy project influenced this thesis project. With much emphasis on how to make a message as accessible to the reader as possible.
Her project illustrates how designers consider the shapes, proportions and variations among components–both positive typographic components and the surrounding negative space.

Tinker, Miles A.
Professor Emeritus
Psychology Department
University of Minnesota
Minneapolis, MN
**Spatial Arrangements
of the Printed Page**
Legibility of Print

Ames, IA: Iowa State UP,
1969.
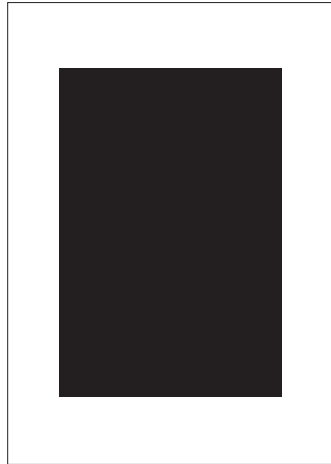
An example of the part-whole proportional illusion: both black and white area cover about 50% of the page, although visually the black area seems to be larger.

" The results show that the 300 subjects, on average, overestimated the center area in relation to the total card area by 18 percent. It makes no difference whether the central area of the card was black on white or white on black. These results prove the existence of a part-whole proportion illusion. This illusion undoubtedly affects reader judgments about the area of the book page that is taken up by print."

Impact

According to Tinker's study, readers believe 75% of the page to be covered by print. This example supports this thesis by providing certain factors that negative surrounding space becomes more larger than the actual proportion. Reader generally have a 50:50 proportional perception of negative space.

Samara, Timothy.
Principal, Samara Lee
Communication
Design, Inc.
**A Graphic Design
Layout Workshop**
*Making and Breaking
the Grid*

Rockport Publishers,
2005.

For designers working in every medium, layout is arguable the most basic and most important element. Effective layout is essential to communication and enables the end user to not only be drawn in with an innovative design but to digest information easily. This book is a comprehensive layout design workshop that assumes that to effectively break the rules of grid-based design one must first understand those rules and see them applied to real-world projects.
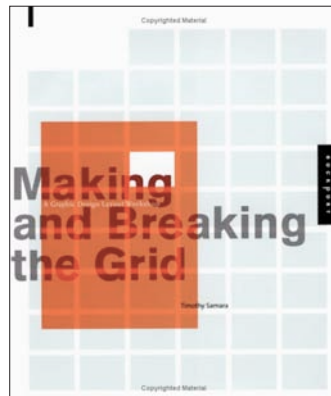
Impact

As the title implies, work teaches how to both successfully apply and translate the grid system in design. The grid system will reinforce my application with guidance on what forms of grid work for different situations.

Mission, Goals, Objectives, Processes

Mission		**Evaluate Use of *Negative Space* to Enhance Readability**

Goal 1		**Define *Negative Space* within Typography**
	Objective	**Definition** • establish definitions to develop an understanding the scope and purpose of *negative space*
	Process	• gather information about *negative space* through relevant literature • develop a set of definitions for *negative space* terminology
	Objective	**Attributes** • identify attributes, function, and consequences of *negative space*
	Process	• research attributes that play a important role in readability • collect examples that demonstrate effective use of *negative space*

Goal 2		**Develop Use of *Negative Space* to Improve Readability**
	Objective	**Purpose of *Negative Space*** • classify and organize uses of *negative space*
	Process	• gather examples of uses of *negative space* from a variety of disciplines • contact typographic design advocates • extract specific theory related to spaces between elements from research • develop matrix of *negative space* and theory
	Objective	**Demonstrating Effectiveness** • demonstrate effective use of *negative space*
	Process	• define effectiveness • compare and analyze a range of *negative space* contents • evaluate results through case studies

Goal 3		**Develop Guidelines and Conduct Evaluations**
	Objective	**Sharing New Insight** • develop an effective means for sharing new insights about *negative space* with graphic design professionals, students and educators
	Process	• determine the best method for distributing guidelines • conduct user testing of final application

Explanatory Diagram

Problem Definition

Define *Negative Space*

Establish definitions
Identify attributes, function, and consequences

Research
Relevant literature
Find experts – contact, interview
Collect examples

Acquiring Information →

Understand the *Negative Space* within Typography

Synthesis

Analysis

Classify information
(position, direction, form, structure, and size of *negative space*)
Organize information in most effective way

Demonstrate Effective Use of *Negative Space*

Compare/analyze of the organization
Define effectiveness
Evaluate results through case studies

Intermediate Evaluation →

Develop Use of *Negative Space* to Improve Readability

Implementation

Sharing New Insight

Categorize the method of success
Determine the best method

Retrospective Evaluation →

Develop Guidelines and Conduct Evaluations

Final Application Demonstrating Effective *Negative Space*

Evaluation Plans

The evaluation plans for this thesis include : needs analysis, research gathered, ideation, implemented solutions, and final evaluations.

Preliminary Evaluation

The preliminary evaluation will occur within the ideation phase.
Through personal interviews and questionnaires, professionals directly involved with typographic design and readability awareness will be solicited for feedback regarding the thesis project and its application. The results of the evaluations will offer valuable suggestions of effective use of negative space in graphic design.

Intermediate Evaluation

The intermediate evaluation will occur within the implementation phase. Comments, suggestions, and questions from the thesis committee will be considered and may be incorporated into the study. The main objective of this is to evaluate the clarity of communication goals and concepts. The results of the evlauation will be reflected in the final solution.

Retrospective Evaluation

The retrospective evaluation will occur after the implementation phase is complete. A survey will be given to professional graphic designers outside RIT to review the finished application. The evaluation will be developed to get more in-depth responses about the function of negative space. The final application will be a system for improved understanding of effective negative space.

Timetable

Fall
Winter
Spring

September

05 Fall Quarter Begins

20 Committee Selection

October

14 Last Date to Withdraw

14 Proposals Signed

November

08 Election Day

20 – 28 Fall / Winter Break

17 Planning Document Due

15 Committee Meeting

Week 1   Week 2   Week 3   Week 4

Timetable Continued

Fall
Winter
Spring

December

17 Winter Break   25 Christmas Day

01 Research / Analysis   **15 Committee Meeting**

January

01 New Years Day   09 2006 Classes Begin

09 Preliminary Writing   **21 Committee Meeting**
19 Synthesis

February

02 Presentation to 1st Grads   14 Valentine's Day   27 Final Exams

07 Ideation / Evaluation   **19 Committe Meeting**

Week 1   Week 2   Week 3   Week 4

Timetable Continued

Fall
Winter
Spring

05 – 13 Winter / Spring Break

March

01 Implementation

14 Committee Meeting

07 Thesis Show Preparation

16 Easter Sunday   21 Last Day to Withdraw

April

03 Gallery Opening   **10 Committee Meeting**   19 Show Comes Down

27 Commencement

May

04 Final Writing   **16 Thesis Sign Off Meeting**

Week 1   Week 2   Week 3   Week 4

Document Structure

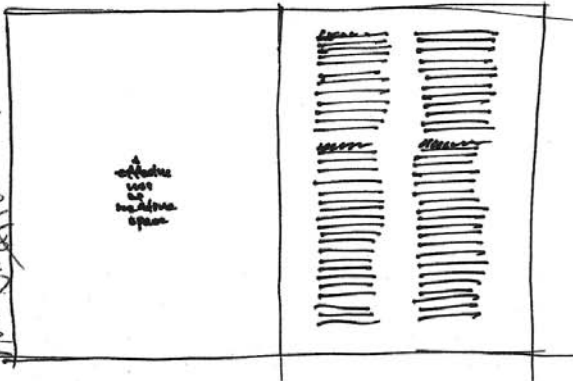|	
Thesis Project Definition	Introducing, Identifying, and understanding the nature of the problem– including history, situation, and goals
Precedents	Describing other existing projects, case studies, and models that have meaningful relationships to study
Research	Describing facts, principles, theories, or relationships that have been discovered to help solve the problem
Synthesis	Describing interrelationships and patterns– sorting, sequencing, and ordering information or parts of the problem
Ideation	Describing the generation of conceptual solutions and preparation of a range of preliminary design approaches
Intermediate Evaluation	Describing testing strategies that were used to judge ideation and the resulting selection of possible design solution
Implementation	Describing how the project was refined, developed, and produced to its final form or application
Dissemination	Describing plans for future audience interaction– how could this product or information be distributed/used in the future?
Retrospective Evaluation	Assessing the final product to determine strengths and weaknesses– how could future versions be improved?
Conclusion	Summarizing overall experience and outcome– what was gained?
Glossary of Terms	Defining particular terms that were used within the written documentation to aid in reader understanding
Bibliography	Listing all sources used for the study by category– books, journals, magazines, web sites, etc
Appendices	Labeling each tool, involvement or activity separately– enabling the reader to refer to more in-depth detail at the end of the documentation

Initial Ideation Sketches

These space – related sketches are selected from an investigation of readability.
It shows how to make important parts stand out from its surroundings (negative space).
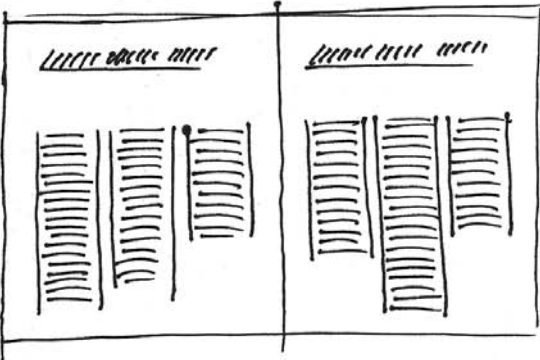
Space
Contrast

Emptiness / fullness
: The huge negative space in the middle of which the short message is set off against the full texture of the page, right.
at
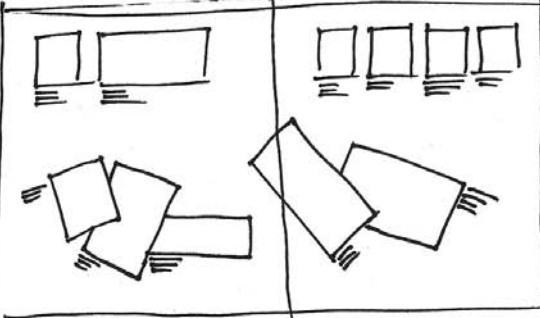
Alignment / randomness
: • Top of the text : aligned
                      precisely
  • Text in the columns
                  : hanging
                    variegated

× show against enough negative space to make them both noticeable.

another
×) example
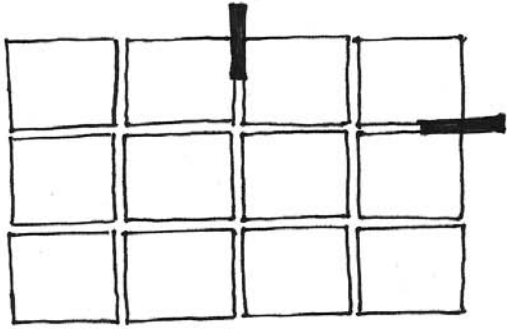
Equal space

: looks like single rectangular block.

Equal wide space

: still rectangular block-as-a-whole
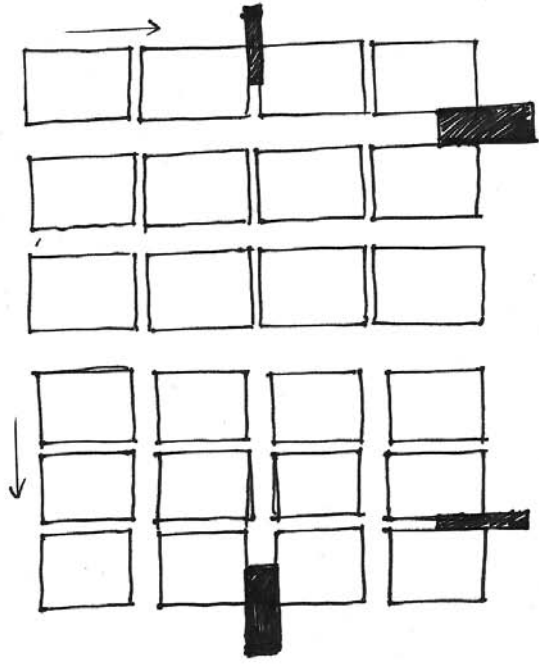
Unequal space (improve readability)

: three separate layer
  head left → right

: four colums of three
  head top to bottom.

effective use of negative space

more
visible

monotony

passive   active

passive

active
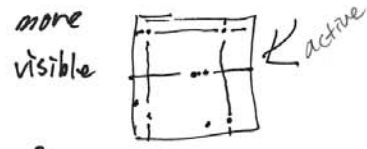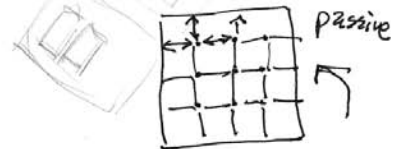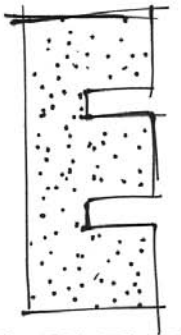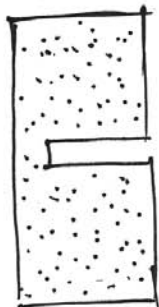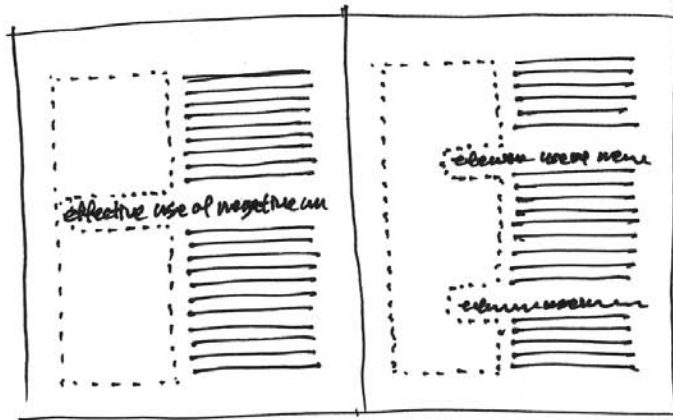
: Break out of the framed area
  into the surroundings (negative space)
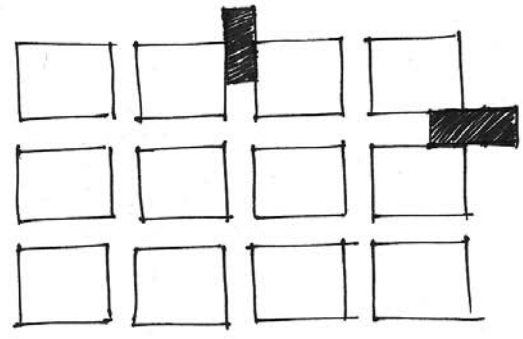
effective use of negative space in print

effective use of negative space in print

50% 50%
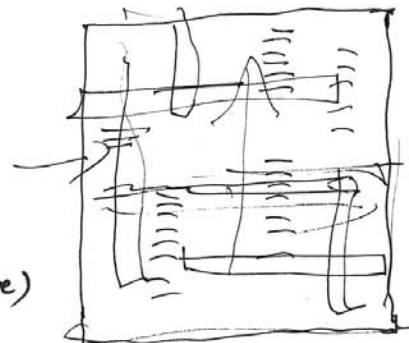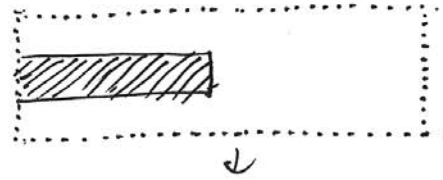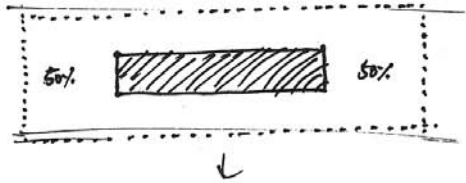
- Centering the head over the columns divides that valuable negative space into two insignificant halves.

- The blackness of the type stands out better when it is contrasted against that larger area of "negative space".

Head or top margin

Back or
gutter
margin

outside,
side, or
fore-edge
margin

tail, foot or bottom margin
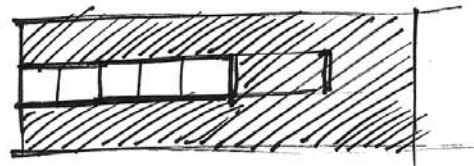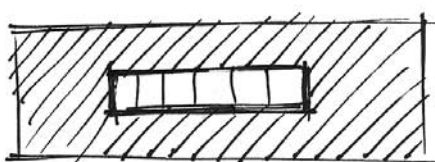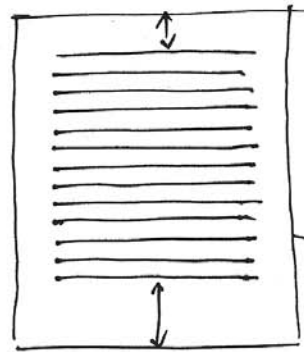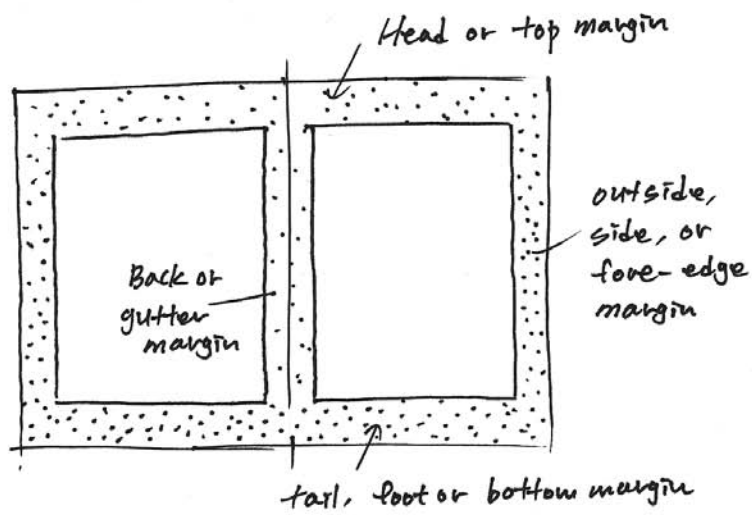
: bottom margins
wider than top margin
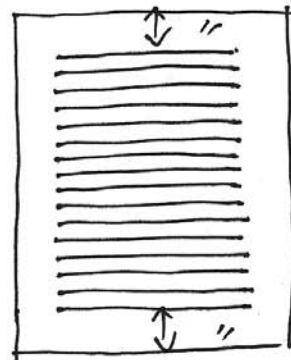
: top and bottom
margins are equal
(two low on the page)
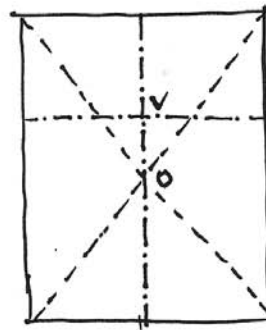
: The 'optical'
centre of a page
(v) is well above
the 'geometrical'
centre (o)
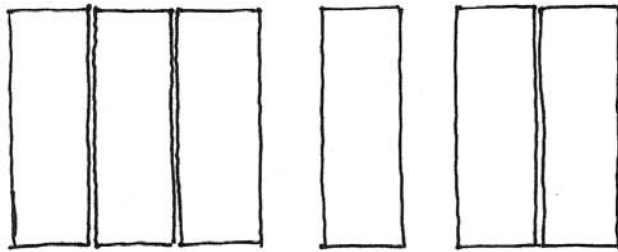
· Narrower space
  : glue things together

· wider space
  : Separate
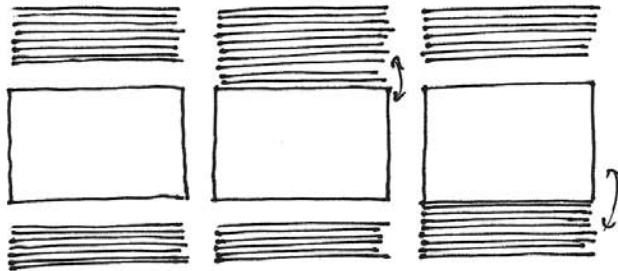
Closeness
  : relationships.
    between text and pic

Move space above headings.
                    (Subheads)

  : function of Subhead is
    to draw the reader into
    the text below.

  ⊙ heading

  : It succeeds if the
    spaces are unequal.

50%   50%

boring

95%   25%

Interesting
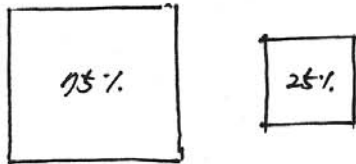
positive ←   positive
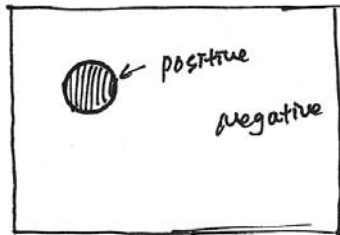
negative

Negative space defined by positive space

: It is perceived as black ground and unnoticed until place elements in it
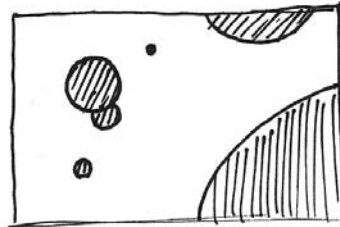
boring

Interesting
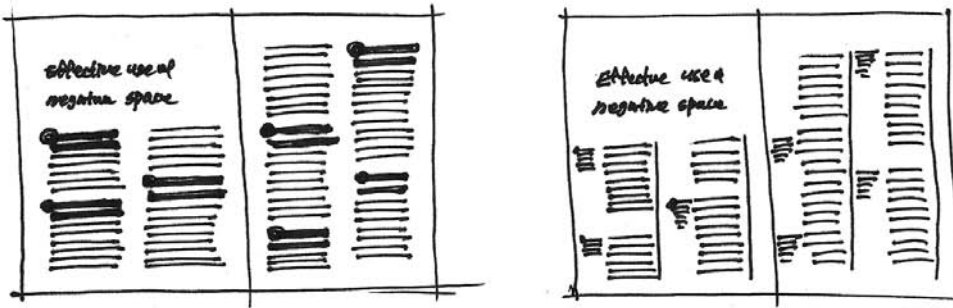
- Q & A : The right one showing two equals conversing side-by-side. Also it can be scanned fast to find that interesting question
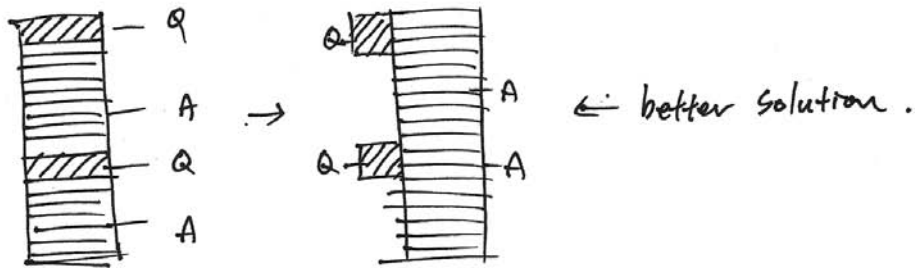
← better Solution.

• Number or bullet
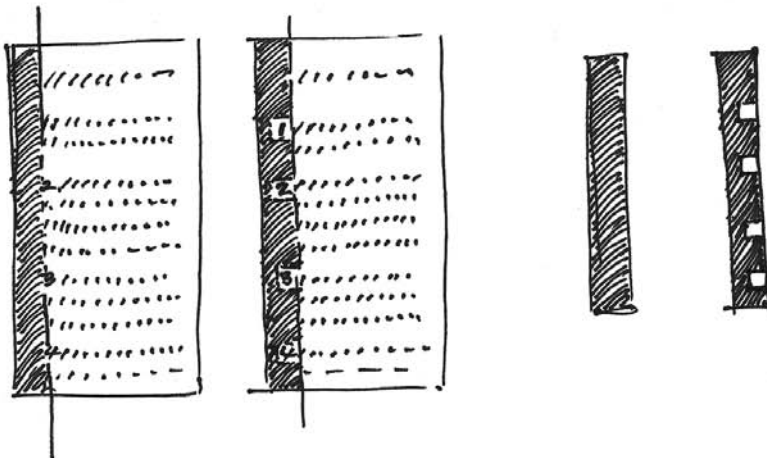
Thesis Definition

Situation and Audience
The use of negative space as an element of graphic design began with the European modern art movements of the early 1900s. Similar to the way in which typography review the hierarchy of information in a massage, effective use of negative space provides a flexible way to control visual hierarchy (emphasizing and distinguishing primary, secondary and tertiary information). In addition, negative space helps to prioritize and emphasize unnecessary elements and allows important elements in a logical structure. These functions of negative space play a significant role in contributing to the effective readability of text typography.

Readability is the ease of reading an entire composition for print or for a digital application. Among the many elements that help to improve readability, negative space is crucial in communicating messages with typography. This thesis will expand the definition of terms and principles that determine the effective uses of negative space in printed text typography.

The primary audience is undergraduate sophomore level graphic design students. The secondary audience will be graphic design educators. This thesis attempts to improve readability for experienced readers who have college-level reading ability.

Graphic Design Thesis Content
This thesis project focuses on identifying and defining methods of using effective negative space to improve readability in typographic design. From the research and synthesis, a set of guidelines will be developed to help graphic designers better understand the use of negative space and strengthen the readability in their work.

Outside Content
Newspapers and magazines are the most publicly recognized print media forums that present information in a wide range of typographic treatments and use of negative space. The reader's desire and need is to fully absorb this information easily and quickly. Therefore, to critically test this thesis hypothesis, the use of negative space in newspapers and magazines will be analyzed for effectiveness. New insights gained from this study will be applied to improve use of negative space in a reference poster.

Goals and Objectives
This thesis will investigate the potential of effective negative space to improve the readability of text typography and to develop a systematic approach to addressing negative space considerations.

Effective Use of Negative Space in Graphic Design

2006 Thesis Show
Graduate Graphic Design Program
School of Design
College of Imaging Arts and Sciences
Rochester Institute of Technology

D H Lee
MFA Candidate

Existing Reference Poster: Ineffective Use of Negative Space

RIT Web Offset Poster Reference Poster

Negative Space Problems

- No clear distinctions among different categories of information
- No clear typographic hierarchy with respect to type size, type weight, and color
- No consistent intervals of negative space among text and photographs
- No clear sequence of order
- No marginal space for the eye to rest

Research and Synthesis

To analyze the implication between readability and negative space, two theories were selected through an extensive research. Gestalt Theory and Readability are based on typical human perception. Several principles of visual perception can be used to determine good readability using Gestalt Theory Grouping Laws.

Similar to Gestalt Theory, the Seven Design Principles listed below contribute to helping readers access and comprehend content more effectively and more efficiently. These principles are basic to all composition, whether for print or digital applications

Gestalt Theory Grouping Laws

Proximity Elements tend to be grouped together according to their nearness, As the example shows, four circles in the right appear to be in one group whereas two circles in the left appear to be in a group of their own. This is due to the fact that a larger gap exists between the two groups than exists between each individual circle in a group.

Similarity Items similar in some respect tend to be grouped together. Even though all shapes have the same space in between, four squares form a group and four circles form another group. This perceptive process is caused by the Laws of Similarity.

Closure Items are grouped together if they tend to complete some entity. A square is implied to fill in the empty space to form a complete rectangle. Human mind tends to enclose spaces by completing contours and ignoring gaps between shapes.

Continuation Items appear to be in a continuation of direction if they are aligned a certain order. The three circles appear to be on the same rising line in this example. Human mind tend to perceive continuation in a smooth, contours rather than abrupt changes in direction.

Figure / Ground Some objects take a prominent role (the figure) while others recede into the background (the ground); In this example, circle is the figure and the rest of the area within the square is the background. This phenomenon is made possible by contrast.

Seven Design Principles

Contrast Contrast means showing differences in two different sections of the design or showing somehow that the design being created is very different from other designs because of contrast. Contrast can also be used to show emphasis in any part of the design.

minor   *dominant*

Balance Balance refers to the distribution and visual equilibrium of the elements that causes the total image to appear balanced. Balance can be either symmetrical or asymmetrical in a design. In the case of asymmetrical design, the composition is more dynamic.

symmetrical   *asymmetrical*

Unity Unity is a condition or quality of design that is achieved when individual elements are grouped. Unity helps the design to be seen as one design instead of random, isolated elements in the design.

part   *group*

Rhythm Rhythm is the tempo of visual movement, achieved through repetition of line, shape, or color. Similar to music, rhythm establishes a visual pattern.

busy   *repetition*

Proportion Proportion is the relationship of visual elements, one to another and to the whole. We consider this particularly in relation to size, shape, color and quantity. Proportion can cause variation. In the case of active design, the composition is more dynamic.

passive   *active*

Movement Visual movements are used by designers to direct viewers through their work, often to focal areas. Such movement can be directed along line edges, shapes, and colors within the composition.

direction

Harmony Harmony means keeping elements in a state of agreement in which all sections of the pattern make other sections complete. It is the opposite of contrast and implies simplicity of design. Harmony does not interrupt, but allows for a smooth even flow.

disagreement   *agreement*

Example of Outside Content: Proximity, Unity/Harmony

London Guardian

New York Sun

The comparison between the *London Guardian* and the *New York Sun* is an example of a dense composition with very little negative space. Elements other than columns have been excluded to demonstrate the Gestalt *Laws of Proximity* and *Unity/Harmony.*

As shown in the *London Guardian*, the main article and sub-articles are clearly divided by negative space; however, in the *New York Sun*, the articles are not as clearly divided as in the *London Guardian*. Narrower spaces tend to associate elements, and wider spaces tend to separate and disassociate elements.

Example of Outside Content: Figure and Ground, Contrast

Living

Country Living

The comparison between *Living* and *Country Living* is presented to show an example of a sparse composition with ample negative space. All areas other than negative space are colored to demonstrate an example of the *Laws of Figure & Ground* and *Contrast.*

As shown in *Living,* an effective use of negative space allows placing emphasis on each figure; however, *Country Living* is not able to focus on each figure because all figures are tied together and there is no distinction between elements by using negative space.

Redesign of Reference Poster: Effective Negative Space

Web
Offset
Printing

Offset lithography is the most widely used print process. About 40% of all print jobs are produced using offset printing.

Feeding

The automatic reel splicer, connects the shorter rolls of paper about to end to a fresh new roll without stopping the press. The infeed system maintains the proper tension for the web to pass through the printing units.

Printing

It is an indirect printing process that an image is transferred, or offset, from one surface to another. The plate transfers the image to a rubber blanket which offsets the image onto a substrate pressed between the impression cylinder and blanket cylinder.

Control

The console allows the press operator to do many tasks from one area on the press, such as adjusting color for image control, speed, moving plates to make proper registration, web tension, automatic plate and blanket cleaning, dryer temp. etc.

Drying

After the paper is printed on it travels from the printing units to the finishing system. The web is cooled with the *Ecocool Integrated Dryer* System. The system puts moisture back into the web to improve its strength and color.

Folding

The *PCF-1* pinless folder is a folding system eliminates time wasting tasks, by eliminating the folder pins that would puncture the paper, making the punctured area to be trimmed off. The folder system can produce more than 18 different folding formats. It allows for easy change over from one job to another, and stores the job for future use. Once folded the printed products continue across a conveyor belt where it will be packaged, boxed and shipped. All these advantages help for a better quality and productive and steady workflow.

Examples of print; newspapers, magazines, books, advertising pieces, brochures, posters, greeting cards, folders, mailers, coupons, and art reproductions.

Proximity, Unity/Harmony
Text typography is separated and divided by negative space. By doing so, randomness of the original poster was eliminated and all contents now form a harmony. In addition, the beginning and ending of each component is clear.

Similarity, Rhythm
All typographic elements are set in one typeface with proper variation in size and colors to reveal hierarchy. In order to create rhythm, the same distance was applied between each heading.

Closure, Balance/Proportion
Balance and proportion of the component were adjusted by grouping text and photographs together with their own kind. Each paragraph seen as a rectangle, making it is easier to recognize there are five steps in printing process.

Continuance, Movement
The order of the component corresponds to the order of the printing process. Unlike the original poster, the reading direction is from the top to bottom. The continuance of the contents is not disturbed by a complex movement.

Figure and Ground, Contrast
The color of negative space in the original poster was too saturated and distracting the negative space blended into the positive space. Clusters of component are balanced against large white areas of negative space.

Harmful Effects

of Alcohol & Drugs on the Fetus and Infant

How Drugs Travel from Mother to Fetus and Infant

Alcohol, Drugs, and Harmful Substances taken by the Pregnant Mother that travel through the Bloodstream to the Fetus

(Alcohol, Nicotine, Marijuana, Cocaine, LSD, PCP, Heroin, Medications, Sleeping pills, Sedatives, Aspirin, Foods containing caffeine such as Coffee, Tea, Colas, and Chocolate)

The fetus shares almost everything the mother takes into her body, whether eaten, smoked, injected, sniffed, or swallowed. Drugs and harmful substances such as alcohol, nicotine, marijuana, cocaine, LSD, PCP, heroin, medications, aspirins, and foods containing caffeine, are all transferred from the mother's blood stream to the blood circulation of the fetus—and therefore must be avoided! These chemicals easily pass through the placenta and are transported through the large blood vessel of the umbilical cord to the fetus, with the two smaller arteries carrying deoxygenated blood, containing waste products back to the placenta.

During the entire pregnancy, especially the first few months, the developing fetus is extremely fragile, vulnerable, and has great difficulty in ridding itself of harmful chemicals remaining unprocessed in the bloodstream or circulating in the amniotic fluid. Exposure to these substances greatly increases the risk of miscarriage, early infant death, low-birth weight, SIDS, stillbirth, premature birth, brain damage, mental retardation, growth impairment, birth defects and deformities, addiction and withdrawal.

Pathway of Drugs through the Mother to the Fetus

1 Drug enters body through the mouth (Drugs also enter the body through intravenous injection and by sniffing or snorting chemicals through the nose)

2 Drug enters the stomach

3 Drug enters the intestine

4 Drug is absorbed through the intestine and enters the mother's bloodstream

5 Drug passes through the placenta and is carried through the umbilical cord to fetus

6 Drug enters blood circulation of fetus and is pumped throughout the infant

Drugs being transferred to the Infant during Breast-feeding

Alcohol, drugs, and harmful substances taken by the mother are transferred to her infant while breast feeding. These microscopic chemicals pass through milk glands and ducts in the breast when the infant is feeding. The chemicals are then absorbed and pumped throughout the infant.

1 Drug molecules
2 Milk glands and ducts
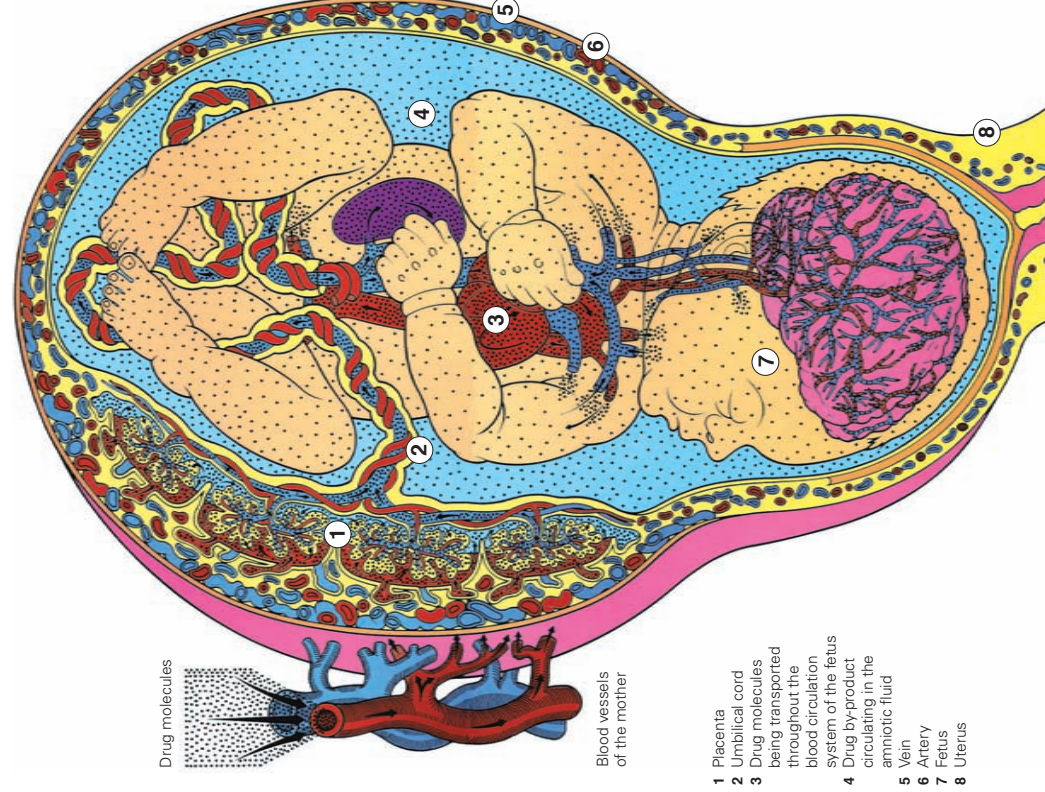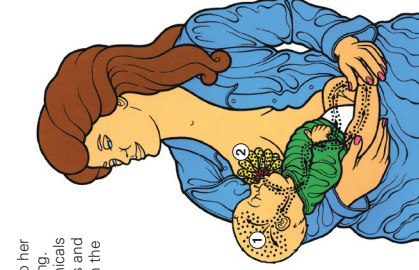
Drug molecules

Blood vessels of the mother

1 Placenta
2 Umbilical cord
3 Drug molecules being transported throughout the blood circulation system of the fetus
4 Drug by-product circulating in the amniotic fluid
5 Vein
6 Artery
7 Fetus
8 Uterus

Alcohol

Using alcohol during pregnancy increases risk of:

Having a baby born with Fetal Alcohol Syndrome (FAS). A pregnant mother must realize that if she drinks, then so does her baby.

FAS babies are abnormally small at birth and have small heads.

FAS babies brains are smaller and frequently have behavioral and learning problems associated with mental retardation.

FAS babies are hyper-active, jittery and lack coordination.

FAS babies are often born with noticeable to severe abnormal facial features.

Fetal Alcohol Syndrome

Head
Small head size throughout life

Eyes
Short eye slits
Droopy eye lids
Small, widely spaced eyes

Lip
Narrow upper lip

Chin
Small, chin

Brain
Brain damage
Mental retardation
Below average ability and intelligence
Hyperactive

Nose
Broad and flat
Upturned nostrils

Ears
Large, possibly malformed ears

Other Abnormalities
Stunting of growth
Liver damage
Heart and Kidney damage
Alcoholic withdrawal
Tremors and Seizures.

Tobacco

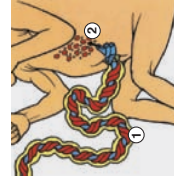**Using tobacco during pregnancy increases risk of:**

Miscarriage
Premature birth

Causes constriction and damage to the blood vessels of the umbilical cord, decreasing the flow of blood, oxygen, and nutrient vital to the developing fetus.

Almost always causes low-birth weight babies.

May cause baby to be born with a small head (and brain), impairs growth, intellect, and emotional development.

Smoking Reduces Flow of Oxygen and Nutrients to Fetus

1 Smoking damaged blood vessels
2 Reduces blood, oxygen, and nutrients to fetus

Marijuana

Using marijuana during pregnancy increases the risk of:

Damaged Blood Vessels of the umbilical cord, and reduces their ability to transport and supply oxygen and nutrients to the developing fetus.
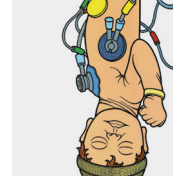
Miscarriage
Stillbirth

May cause baby being born with a small head (and brain).

Poor Growth
Irritability
Birth Defects
Deformities

Low-Birth Weight Baby Born Three Weeks Premature

Cocaine

Using cocaine during pregnancy increases risk of:

Fetal Death
Premature Labor and Delivery
Miscarriage

Sudden Infant Death Syndrome (SIDS). Babies die in their sleep without warning.
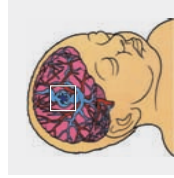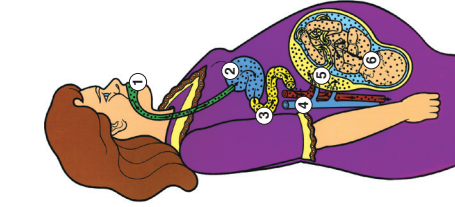
Respiratory Failure
Kidney Trouble
Visual Problems
Lack of Coordination
Retardation

Blood Pressure Changes, caused by cocaine use may cause blood vessels in the fetal brain to burst, resulting in permanent physical and mental damage.

Blood Vessel Bursting in Brain

Increases in blood pressure may cause blood vessels in the fetal brain to burst, causing permanent brain damage.