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### Interdisciplinary collaboration in graphic design

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Jill M. Kepler  
May 2004

Graduate Graphic Design MFA 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

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18 May 2004

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**MFA Candidate**

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Jill M. Kepler

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Date

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Thank you

**Family and Friends**, for their patience, encouragement and support these last two years.

**Fred and Jeanne Keler**, for their love and respect which has given me the confidence and ambition to continually succeed in all of my endeavors.

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**Jim Perkins**, for his time, interest and expertise in Medical Illustration.

**R. Roger Remington**, for his time and willingness to share his passion for research and knowledge of graphic design history.



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## Thesis Proposal

## Problem Statement

**Design Content** Design is often a viable solution to such issues; however, there is often a void in the way design has attempted to communicate information and educate the public about similar complex and misunderstood issues in the past. Designers sometimes fail to break entrenched professional boundaries and work as part of a productive team throughout the development of projects. Interdisciplinary collaboration needs to be a component that contributes to the overall process of Design. **Outside Content** Tourette Syndrome is a neurological disorder that is characterized by multiple involuntary motor and vocal tics. There is a lack of awareness within the medical community and particularly with school officials and teaching professionals leading to misdiagnosis and extreme social and learning ramifications for children who have Tourette Syndrome.

## Documentation of Need

Tourette Syndrome is a unique and rare disease that affects one percent of the total population and is often misunderstood. Tourette Syndrome is a genetically determined neurological disorder that has a biological connection to the designer's family, hence the research topic of Tourette Syndrome is of personal importance. This thesis projects attempts to develop a model and exemplify a structured set of criteria and principles to inculcate a professional interdisciplinary team-oriented Graphic Design culture. Interdisciplinary collaboration will enable designers to better solve complex problems. Reinvigorating the professional practice of graphic design toward an interdisciplinary culture will increase the meaning of design for society.

## Situation Analysis

The outside content will address the principal adults who interact with Tourette syndrome children such as parents, educators and physicians. Viewer's environments for the design component will include the physician's, psychiatrists and social workers office as well as a college level medical classroom. The secondary audience will be children who have Tourette Syndrome. Obstacles and constraints for the outside content will be creating visual communication for audiences that range in age and overall level of education or level of awareness concerning Tourette Syndrome. Thesis content will consist of examining historical and contemporary design work and identifying precedents. The primary audience for this thesis will be professional graphic designers.

## Goals

The designer will compare and contrast case studies of individual design solutions with complex design solutions developed through multidisciplinary collaboration. Collaboration will be explored by referencing and observing a variety of working models of teamwork and social processes in problem solving in order to identify and visually communicate collaborative variables and structure. Through collaboration, a design solution will be developed for the Tourette Syndrome society. This artifact's unique contribution will be part of a continuum of activities which will contribute to the future. Tourette Syndrome will be used as a vehicle to provide a successful working design solution that demonstrates team effectiveness for graphic design. This is an attempt to foster a professional interdisciplinary team-oriented culture for design practice.

## Processes and Strategies

Methodologies will include gathering a variety of materials, websites, books, ETC Media Lab, observations, personal interviews, conducted tests, etc. Principles and Theories: Through research, process, theory, critical thinking, investigation, and discovery, a design solution will emerge which designers will be able to use as a reference. This reference will allow designers to analyze interdisciplinary collaboration and better understand how to integrate teamwork into their working structure. Collaborative structures and variables will be analyzed by conducting interviews and examining case studies. Various methods such as mindmaps, comparative matrices, and forced juxtaposition will be used in order to acquire and work effectively with interdisciplinary groups.

## Possible applications

Various print materials, interactive design, children's games, and other concepts were generated. The appropriate artifact(s) and/or form(s) and position that design will take is dependent on research and analysis. A multidisciplinary, collaborative design solution will be implemented for the Tourette Syndrome audience. This design solution will exemplify and be accompanied by a set of criteria and principles that will encourage a professional Interdisciplinary team-oriented culture for the graphic design profession.

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**Mission, Goals,  
Objectives, Strategies**
**Mission**

To stimulate interest and facilitate understanding in collaboration in contemporary design practice. To visually communicate collaborative variables and structures to aid the designer and the laymen in recognizing possibilities and opportunities. To articulate and visualize the benefits of collaboration to facilitate understanding and manageability. This project will be used as a viable example to assist the practice of graphic design by encouraging a professional interdisciplinary culture.

To develop a model of cooperative effort between a designer and multidisciplinary groups working together throughout the development of a project to facilitate cohesion and effectiveness in improving the life for children and families who live with Tourette Syndrome.

**Goal 1**

**To emphasize the importance of designers and multidisciplinary groups working together throughout the development of a project.**

**Objectives**

To demonstrate that the practice of graphic design has many participants and most of them are not designers.

Reveal that negotiations and financial concerns are often realities of the multidisciplinary process.

Identify the parameters of a design problem and how complex design problems can be better solved by breaking these entrenched boundaries and working as part of a team.

**Processes / Strategies**

Survey a range of professional design projects from the past and present; list participants to demonstrate how many and how often non-designers are involved.

Locate examples where negotiations, grant work, and various financial concerns were part of the collaboration.

Compare and contrast simple case studies of individual design solutions with complex design solutions implemented through multidisciplinary collaboration.

Use mind mapping as a tool to identify the complexity of a design problem and generate associations that may not otherwise have been considered for identifying multidisciplinary team members.

Create a perceptual map that will allow designers to evaluate the complexity of a design problem and the problems necessity for multidisciplinary collaboration.

**Mission, Goals,  
Objectives, Strategies  
continued**

**Goal 2**                      **Eliminate factors that contribute to designers being consulted at the implementation stages of projects.**

**Objectives**

Clarify Interdisciplinary Collaboration by referencing and observing current working models of teamwork and social processes in problem solving.

**Processes / Strategies**

Research existing models and strategies that facilitate a dialogue and cohesiveness between a multitude of disciplines.

Analyze and restructure current collaborative models in order to generate a new model that has a working relationship with a complex design problem.

**Goal 3**                      **Create awareness for children and families who live with Tourette Syndrome**

**Objectives**

Establish a working relationship with doctors, parents, teachers, designers and organizations that dedicate themselves to creating awareness and understanding for Tourette Syndrome.

**Processes / Strategies**

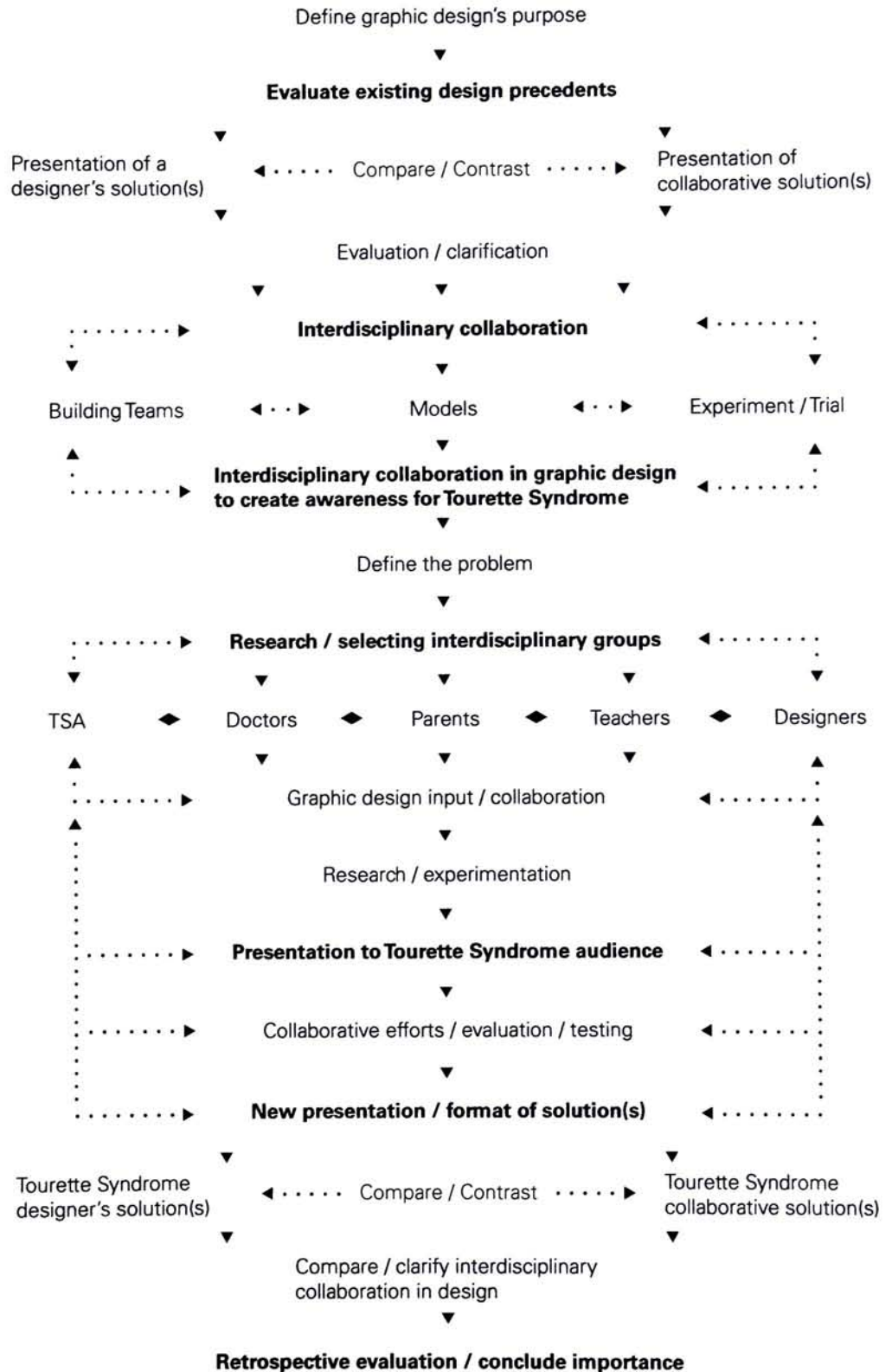
Contact the Tourette Syndrome Association, evaluate their efforts in creating awareness and establish a working relationship with key members involved.

Make contact with local teachers, doctors, parents and children concerning needs, realities, and sub-problems that may need to be addressed.

Facilitate direct observation, conduct interviews, listen to their concerns, explain ideas to them and initiate feedback loops.



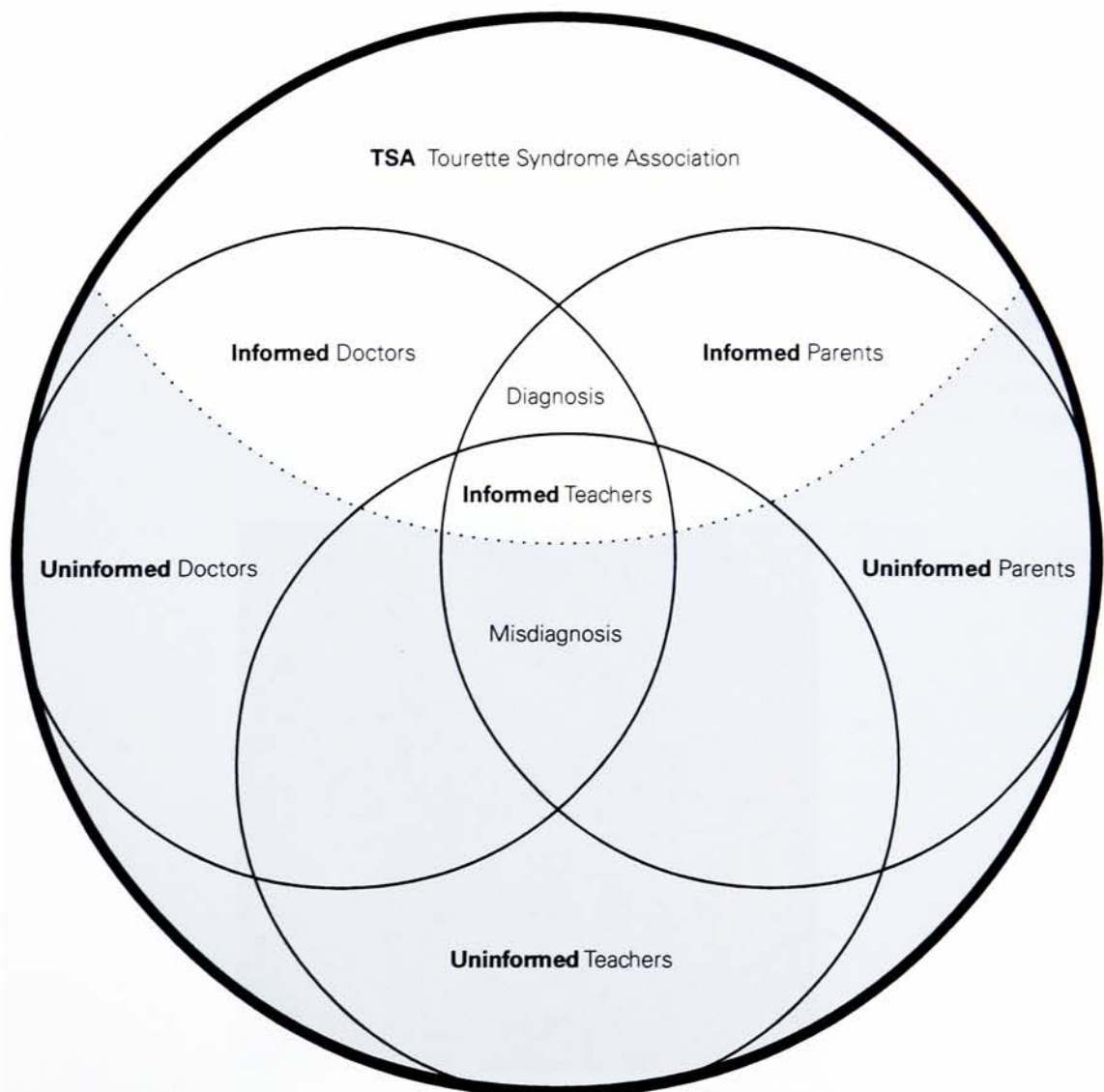
**Visual Diagram**  
**Overall Thesis Process**



**Visual Diagram  
Outside Content**

This diagram illustrates the different groups of people to be studied concerning Tourette Syndrome awareness.

- The shaded areas are where the focus of research will take place. The boldest outer ring contains all of the interdisciplinary groups that will be in collaboration throughout the development of the thesis application.
- The union of uninformed parents, uninformed doctors, and teaching professionals are critical. These three groups in the shaded area will need to be united with the informed groups in the white area. Groups in the white area are successfully working in collaboration with the Tourette Syndrome Association.



## Precedent 1

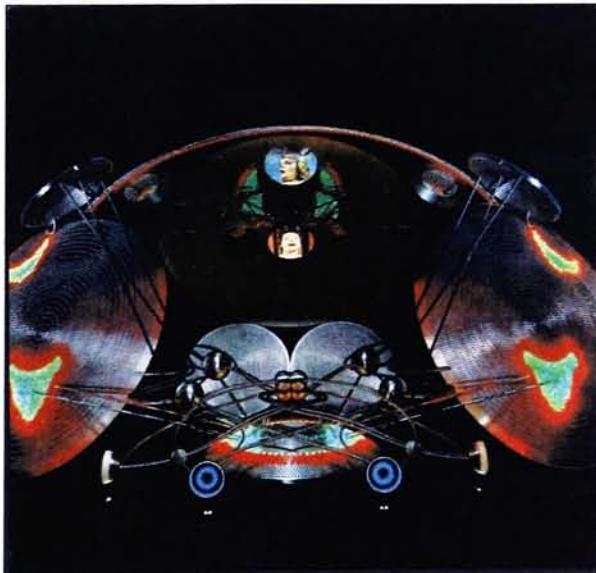
## Will Burtin

Bauhaus-influenced graphic and exhibition designer, Will Burtin (1908 –1972) was trained as a typographer and designer at the Werkschule, in Cologne, Germany, where he later taught design. Burtin immigrated to the U.S. in 1938 and designed exhibitions for the Federal Pavilion at the 1939 New York World's Fair. From 1943 through 1945 he was involved in the American war effort producing training manuals and exhibitions for the Office of Strategic Services and the U.S. Army Air Corps. Burtin's scientific exhibits for Upjohn Pharmaceutical were exemplars of information design. Upjohn is a large pharmaceutical firm in Kalamazoo, Michigan. Burtin's work for Upjohn demonstrates a desire to clarify scientific information.

In 1958 Burtin completed *The Cell Exhibit* for The Upjohn Company. In 1960 he completed *The Brain Exhibit*. The Brain exhibit conveyed the workings of the mind and the way thought evolves. Burtin was heavily involved in communicating complex problems and consulted with experts from a wide range of disciplines during the process of designing both exhibits. During the design process of *The Brain Exhibit*, Burtin consulted with structural engineers, physicians, physicists, chemists, and other specialists in order to ensure accuracy in the presentation, while preserving simplicity and clarity of communication.

## Significance

This thesis study benefits from this precedent by analyzing early stages of development where design decisions are made to make complex information understandable. This case study will be used as an example to demonstrate success in interdisciplinary collaboration. The Upjohn exhibits communicate complex information clearly, bring a wide variety of people together in one place, and maximize publicity through traveling exhibitions. Please see Appendix C on page 70 for further detail.



Will Burtin

*The Upjohn Brain Exhibit, 1960.*



## Precedent 2

**Richard Saul Wurman**

Wurman studied architecture at the University of Pennsylvania and earned his graduate degree in 1959. He spent 30 years in confrontation with disorganized information and produced a series of publications. The books explain his application of simple logic to the comparison of cities, buildings and urban statistics and mapping, for a range of subjects: careers, city environments, surgical procedures, telephone books, atlases, and corporate chronologies.

In 1965 Wurman developed *The Urban Observatory Proposal* for Philadelphia's City Hall. This unique proposal describes the appropriateness of a museum devoted solely to formation, situation and aspiration. This museum would incorporate and center all the city's information and data basics with nodes and terminals in the various ground floors of a building. This was an attempt to fill the enormous gap in public relations and public education in the region. The people of the city, Chamber of Commerce, and the Office of City Representatives felt this gap. Mr. Wurman's Urban Observatory is analogous to a museum, which he ideally planned for the center of a city.

This observatory contained an oversized community map that could be written and walked on. The map was a working, evolving educational center for the development of the city. The Urban Observatory was a live working space for everyone to promote urban thought and development. The Observatory was a place for public testing and display of new ideas, a place where people could make new connections, find interrelationships and become more proactive.

## Significance

Wurman's *Observatory* is not a place, or a thing, but a belief. It is a belief that, by joining the forces of people, educational institutions and citizens and organizations of the greater community, better solutions to contemporary problems are possible. This ideology builds upon the already existing strengths of people, resources and goodwill. This thesis can benefit from this precedent in terms of choosing a context for design.

The outside content for this thesis is creating awareness for children and families who live with Tourette Syndrome. Designs that are strategically placed in a context which serves as a learning community will help open and maintain that level of effective communication about Tourette Syndrome. Logically, Richard Saul Wurman's *Urban Observatory Proposal* has inspired ideation for a traveling exhibition for Tourette Syndrome. The concept of the *Observatory* is appropriate for the needs of Tourette Syndrome awareness. Social interaction between doctors, parents, teachers, peers, and other various organizations are critical. A concept analogous to the *Observatory* will enable these groups to view the designs together and triangulation will be more likely to occur. Please see Appendix A, page 57 for further detail.



**Richard Saul Wurman**  
*The Observatory, 1965.*



## Precedent 3

**Cipe Pinelis**

Cipe Pineles was the first woman invited to join the New York Art Directors Club in 1943 and was inducted into The Art Industry Directors' Hall of Fame in 1975. Cipe Pineles became a design pioneer, joining a pantheon of design greats. She gave us fifteen pioneering years in magazine publishing. She designed four twentieth century women's magazines, *Seventeen*, *Charm*, *Glamour* and *Mademoiselle*. Cipe Pinelis had great respect for her colleagues, master artists, photographers, typographers, and production people. She often taught others the critical importance of the partnership between writer and designer, editor and art director, and art director and printer.

## Significance

This precedent will be a viable example to analyze a contemporary pioneering designer who successfully taught others the process and benefits of collaboration. This analysis will aid the designer of this thesis in understanding how contemporary creative people interact and participate in the vigorous interchange of ideas and opinions and energize each other positively.

**Precedent 4  
Estelle Ellis**

A personal interview was conducted with Estelle Ellis. The collaboration process, which took place during her years working with Cipe Pineles and Helen Valentine with *Seventeen*, *Charm* and *Glamour* magazines, were discussed in detail. The designer questioned Estelle Ellis about her ideologies in terms of reflection on the subject of collaboration.

Estelle Ellis's current work was discussed; ***At Home with Books: How Book Lovers Live with and Care for Their Libraries***, ***At Home with Art: How Art Lovers Live with and Care for Their Treasures***, and ***Booklover's Repair Kit: First Aid for Home Libraries*** are all current publications that Estelle Ellis has published. The interview allowed the designer to draw conclusions about the overall experience and outcome of Estelle Ellis's involvement with *Seventeen's* collaborative environment; the designer was able to make valuable connections related to the influence of collaborative experience on her current dissemination of work.

Factors that were discussed ranged from interpersonal through interdisciplinary to international collaborative efforts in her current work. New perspectives on collaboration were developed through the interplay and conversation with Estelle Ellis, an individual who fully understands and engages in collaboration on a number of levels. Experiential perspectives on collaboration are useful in allowing the designer to particularly analyze design collaboration, and formalize and theorize about the practice. A discussion of collaborative experiences cross examining Estelle Ellis's past and present allows the designer to examine practical issues regarding collaboration from an experiential perspective.

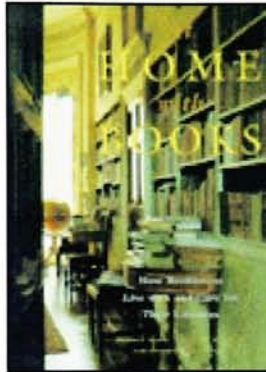
## Significance

The designer is better able to identify various structures and variables that are integral to design collaboration. To this end, the identification influences the designer to theorize the unveiling of these structures and variables, making them more accessible for the inexperienced collaborator.

Estelle Ellis

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***At Home with Books:*** *How Book Lovers Live with and Care for Their Libraries*



**Collaboration**

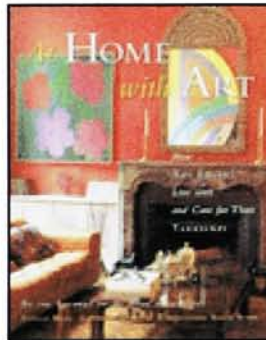
*Christopher Simon Sykes, Photographer*

*Caroline Seebohm, Co-Author*

*Personal Interviews with Book Collectors*

---

***At Home with Art:*** *How Art Lovers Live with and Care for Their Treasures*



**Collaboration**

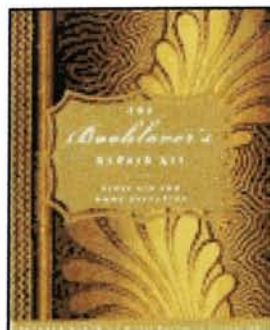
*Caroline Seebohm, Co-Author / Editor Change*

*Martha Caplin, Agent*

*Personal Interviews with artists and art collectors*

---

***Booklover's Repair Kit:*** *First Aid for Home Libraries*



**Collaboration**

*Wilton Wiggins, Douglas Lee, Artists Bookbinders*

*Caroline Seebohm, Co Author*

*Martha Caplin, Agent*

*Andy Hues, Vice President of Production*

*Sunny Knops, President of University Products*

*Tim Ely, Conservationist*

*Lenard Morns, Photographer*

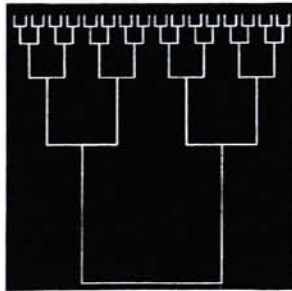
## Precedent 5

## Anton Stankowski

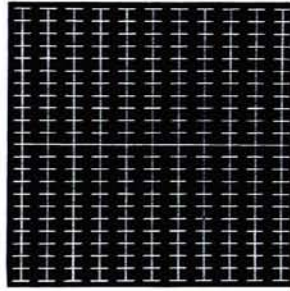
*Visual Presentation of Invisible Processes* by Anton Stankowski is a great resource if one is trying to learn how to illustrate invisible processes in graphic design. Stankowski's book focuses on skeletons, canal systems, networks and grids, and the fine structure of matter which can be seen under a microscope. The illustrations below (p. 55 – 65) represent organizations in nature which can not be seen with the naked eye. The examples are linocuts which exemplify how a square surface can be divided into internal patterns. These patterns can be compared to nature, communication systems, and the function of technological apparatus.

## Significance

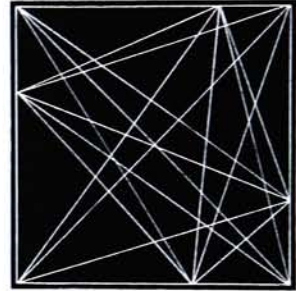
The following examples strongly influenced the designer in communicating the complexity of collaborative structures. Anton Stankowski's linocuts had the ability to be used for other types of distribution systems in nature and technology. The designer analyzed the existing linocuts from a collaborative perspective and was better able to design networks which could visually present detailed relationships between individuals and groups involved in a collaborative effort. (See p. 60)



Progressive duplication



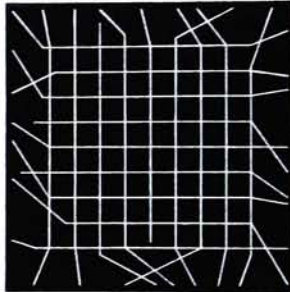
Strict principle of distribution



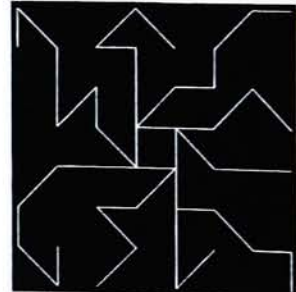
Multilateral connections



Vegetative ramification



Connecting coordinates



Angled pathways



The designer was focused on emphasizing the importance of designers working in multidisciplinary groups throughout the development of a design project. The identification of the parameters of design problems and how particular design problems can be better solved through interdisciplinary efforts was also significant to the users of the design solution. Interdisciplinary collaboration was explored by referencing and observing a variety of working models of teamwork and social processes in problem-solving to identify and demonstrate successful collaborative structure.

Research was conducted concerning the thesis outside content, *Gilles de la Tourette Syndrome*, in an effort to identify primary areas of need concerning Tourette Syndrome awareness and understanding. Creating awareness for Tourette Syndrome will be used as a sample design problem related to the thesis goals.

Projects containing medical content were carefully chosen to aid the exploration of design solutions analogous to this thesis. This exploration led to the investigation of associated medical illustration and information design solutions involving the brain. Communication of non-visual processes was explored in an attempt to make lateral connections with the non-visual process of collaboration and the often misunderstood and misdiagnosed non-visual neurological chemical imbalance that takes place in the brain of those who live with Gilles Tourette Syndrome.

## Design Methods

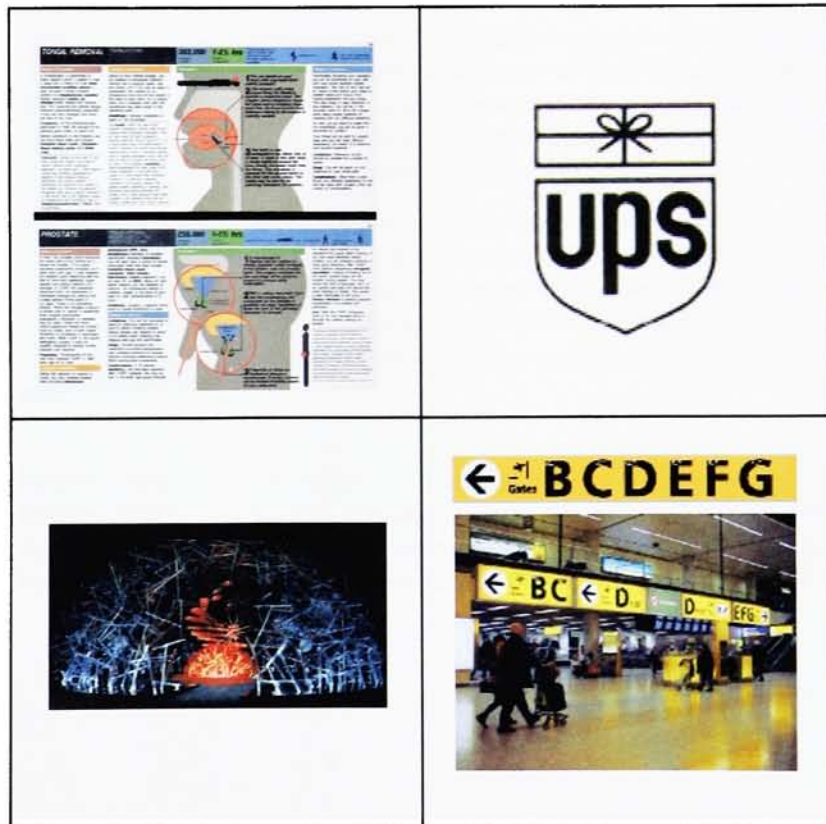
Perceptual Mapping is used to analyze the relationship between the scope of the audience and the size and complexity of the content that needs to be communicated. The top right module of the structure below identifies design problems that may be implemented independently or with very little collaboration. The remaining quadrants identify design problems that require interdisciplinary collaboration.

## Significance

This tool allowed the designer to identify the necessity for interdisciplinary collaboration more efficiently. The map forced the designer to critically analyze the complexity of the content to be communicated about Tourette Syndrome and the scope of the audience in the preliminary stage.

## Limited Audience

**Complex  
Obtuse Content**



**Simple  
Acute Content**

## Wide Audience

Top Left Module

Richard Saul Wurman, *Medical Access Book*

Top Right Module

Paul Rand, *UPS logo*

Bottom Left Module

Will Burtin, *Cell Exhibit*

Bottom Left Module

Bureau Mijksenaar, *Wayfinding System for Schiphol Amsterdam Airport*

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**Matrices**

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The matrices on the next two pages will cross reference past and present design projects across history. Additionally, the matrices will make several lateral connections to collaboration concerning the structure and progress of graphic design projects and make meaningful connections to the thesis outside content.

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**Selection Process**

The first column consists of design projects that were executed independently or with little collaborative effort from outside disciplines. The second column contains design projects from the past and present that were solved with in-depth multidisciplinary efforts. Based on specific criteria, the designer carefully selected the design projects. The projects had to fit the criteria of time and collaborative effort, depending on the module. The designer also selected graphic design examples that represented a wide range of historical and contemporary projects. The projects selected encompass editorial design, exhibit design, poster design, logo and branding design, museum design, interior and multimedia design, medical illustration and Information design.

The selection of projects involving the brain and other medical content was intentional. Tourette Syndrome is a physical disorder of the brain which causes involuntary movements (usually called motor tics) and is not fully understood, but research is continually being conducted. These tics range from echopraxia, echolalia, copropraxia, coprolalia, phalilalia and obsessive compulsive disorder. The brain is the control center for your body; it regulates breathing, heartbeat, muscles and speech control. People who live with Tourette Syndrome have lost part of that control. There is an imbalance that takes place inside the brain.

The Tourette Syndrome community is in desperate need of larger community awareness building. Too many children go undiagnosed and it is not easy finding medical doctors and counselors that understand the disease and the trauma it yields. Tourette Syndrome is a unique medical condition and other conditions often accompany the disorder. An overlap in symptoms often makes a right diagnosis impossible unless by an expert. In addition, this condition is often misunderstood in the public realm.

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**Significance**

Lists of outside expertise involved in the design projects on the following page will aid the designer in determining which outside disciplines are traditionally associated with the graphic design profession. The matrices allowed the designer to make several comparisons to communicate the necessity and benefits associated with different levels of collaboration.



## Matrices

The matrices cross examine past design projects across history and details their collaborative partners.

	Independent Design / Little Collaboration	Design with Collaboration
Past History	<p>1</p>  <p><b>Christopher Wren</b> <b>The Base of the Brain, 1664</b></p> <p>Collaborated with: A doctor</p> <p>2</p>  <p><b>Paul Rand</b> <b>United Postal Service, 1961</b></p> <p>Collaborated with: Client Marketers Printers</p> <p>3</p>  <p><b>J. van Riemsdyk's</b> <b>Obstetrical forceps, 1754</b></p> <p>Collaborated with: A doctor Engraver</p>	<p>1</p>  <p><b>Will Burtin</b> <b>The Upjohn Brain Exhibit, 1960</b></p> <p>Collaborated with: Editors, Writers, Printers, Physicians, Designers, Photographers, Biologists, Chemists, Geneticists, Structural Engineers, Physicists, Other Specialists</p> <p>2</p>  <p><b>Cipe Pinelis</b> <b>Seventeen/Charm/Glamour Magazines, 1940 - 1957</b></p> <p>Collaborated with: Editors, Writers, Printers Designers, Photographers, Master Artists, Typographers, Art Directors, Production People</p> <p>3</p>  <p><b>Design Firm</b> <b>Sandstorm Design</b></p> <p>Collaborated with: Editors, Writers, Printers Designers, Photographers, Art Director, Typographers, Client Linguists, Individuals for testing</p>

## Matrices

The matrices cross examine recent design projects and details their collaborative partners.

## Recent Projects

### Independent Design / Little Collaboration

1



**Alian le Quemec**  
Political, social, and cultural poster design, 1990

Collaborated with:  
Client  
Printers

2



**FutureBrand**  
A global authority on branding and marketing, 2003

Collaborated with:  
Client  
Printers

3



**Pentagram Design, Inc.**  
1994

Collaborated with:  
Art Director  
Client

### Design with Collaboration

1



**Richard Saul Wurman**  
**Medical Access Book, 1985**

Collaborated with:  
Editors, Writers, Printers  
Designers, Photographers,  
Physicians, Nurses, Type Setters  
Surgical Physicians, Patients  
Researchers, Administrators  
Support Staff, Various Medical  
Groups, Architects, Planners,  
Consultants, and Clients

2



**Design Firm Pentagram**  
**Minnesota Children's Museum**  
Director Michael Beirut, 1995

Collaborated with:  
Editors, Writers, Printers  
Designers, Photographers,  
Architects, Children, Lighting  
Specialists, Client

3



**The Designers Republic**  
**Sushi Bar in London**  
Director Anderson, 1985

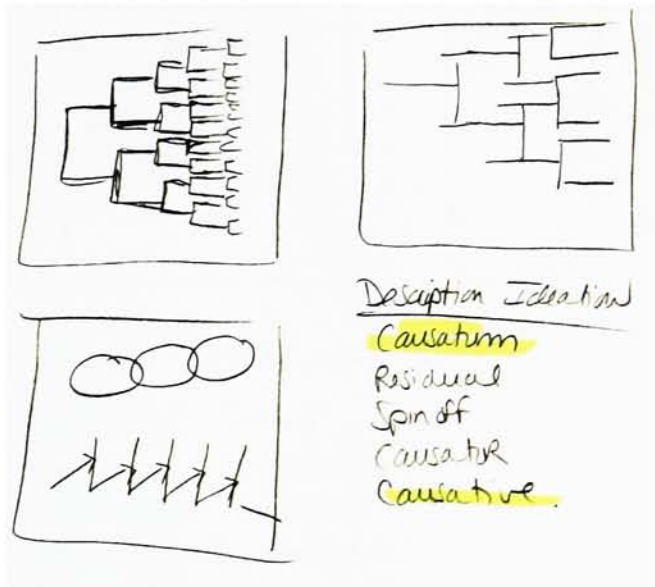
Collaborated with:  
Editors, Writers, Printers  
Designers, Photographers,  
Teams of Architects, Game Developers,  
Lighting Specialists, Acoustic Engineers,  
Multi-media Designers, Client



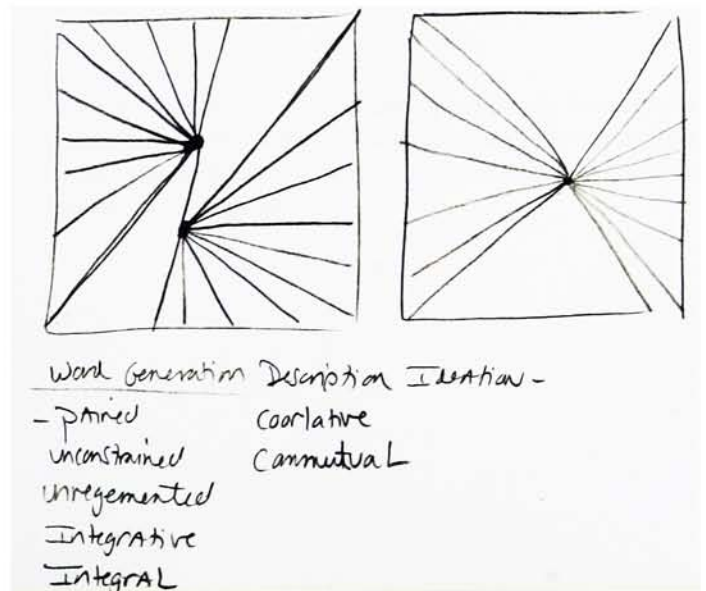
Sketches

The sketches below represent new thinking stimulated from research from Anton Stankowski's linocuts in his book *Visual Presentation of Invisible Processes*. (p. 55-60) The book is a great reference on how to illustrate invisible processes in graphic design. The linocuts have stimulated the sketches below focused on visually presenting non-visual collaborative structures. New models representing various collaborative structures begin to take shape. Please see page 24 to examine the significance of the sketches in correlation with the content that is being communicated. These sketches reveal the preliminary stages of the final collaborative models on page 24.

Chain Reaction

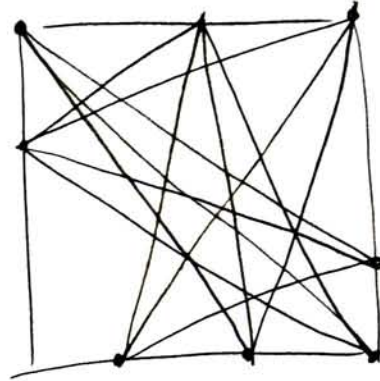
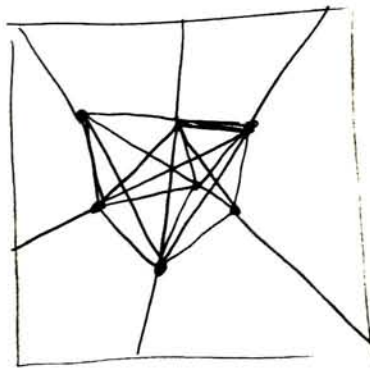


Integrative



Sketches

Formative



Description Ideation-

extensible	Concord
formative	Congruent
coherence	Federation
communion	Fraternization.
mutuality	

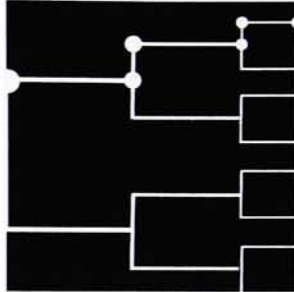
Significance

New connections were developed by combining Anton Stankowski's existing linocuts and new graphic interpretations specifically related to collaborative networks. This combination spawned new thinking for four major foundational structures for collaborative networks presented on page 24.

## Collaborative Models

The following collaborative visual presentations are foundational structures of 4 major types of collaboration inspired by Anton Stankowski's book *Visual Presentation of Invisible Processes*. (p. 55-60).

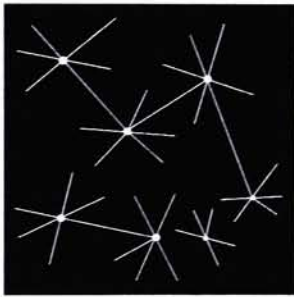
### Chain Reaction



This model consist of a team that has its members in fixed positions. The team members are serially dependent on each other, but rarely collaborate with other members of the team who are not in close proximity according to the team structure. Interdependence on this type of team is very low and this kind of model can become problematic. One members poor performance may affect the overall success of the entire team structure.

- Dependent team members
- Low interdependence
- Autonomous
- Passive, uninvolved

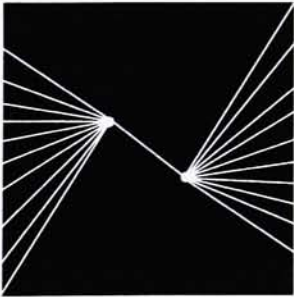
### Disassociated



This model consists of individuals on a team who each do their job their own way. For example all of the divisions work independently. For this reason this kind of team is inflexible and a successful outcome is only possible when the entire organization understands the team structure as a whole and have successfully participated in the sequence several times.

- Independent
- Inflexible
- Team fragmentation
- Delegated
- Subgrouping

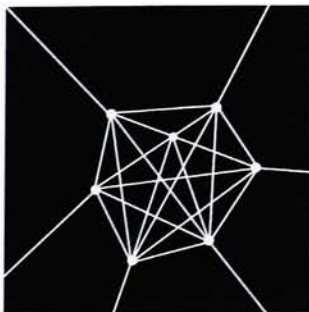
### Integrative



This model consists of a team where each member has their own independent role to play, however, integration occurs with their team members at designated points in the structure. This kind of model usually participates in collaborative structure yet lacks the interdependencies of the Formative model.

- Independent with integration
- Mutual goals
- Consultative
- Mutual adjustment

### Formative



This model consists of a team which is very flexible. The model contains trust, commitment and effective collaborative structure. This kind of model must first be understood and then rigorously practiced before it can be fully functional. Participants in the formative model work interdependently as opposed to individuals focused on their own individual business which is visually represented in the Disassociated model.

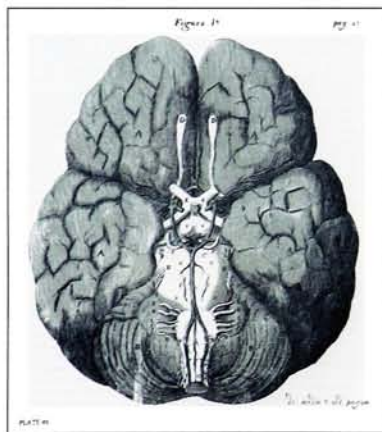
- Flexible
- Commitment
- Equal power distribution
- Reciprocally interdependent
- Joint
- Trust
- Shared data
- Mutual goals

## Research

## Case Study 1

In the past history section of the matrices on page 21 Christopher Wren collaborated with a doctor in 1664 to communicate the parts of the base of the brain. Will Burtin created *The Upjohn Brain Exhibit* in 1960. Through in-depth collaboration with editors, writers, printers, physicians, designers, photographers, biologists, chemists, geneticists, structural engineers, physicists, and other specialists Will Burtin was able to communicate his goal when compared to Christopher Wren. This is not to say that extreme collaboration on design projects is always a necessity to achieve success. The goals of the design project and target audience may often dictate the degree to which collaboration is necessary, as well as which collaborative structure may be the most useful.

For example, it was Christopher Wren's goal to accurately show the placement of the brain parts and describe their significance. In this particular case it was efficient to have an in-depth collaborative experience with an informed doctor. On the contrary, when the designer considers Will Burtin's communication goals, the study of brain functions, it is easy to conclude that an interdisciplinary approach is necessary.



**Christopher Wren**  
*The Base of the Brain*, 1664



**Will Burtin**  
*The Upjohn Brain Exhibit*, 1985

Please see appendices for more detail about the two models shown above. The designer conducted an in-depth case study of Will Burtin's interdisciplinary approaches to the study of the mind. Networking trails, and collaborative materials found in Will Burtin's archives were analyzed. The designer will locate all of the various disciplines and pinpoint areas where disciplines merge to create new combinations of expertise all focused on the same goal.

## Significance

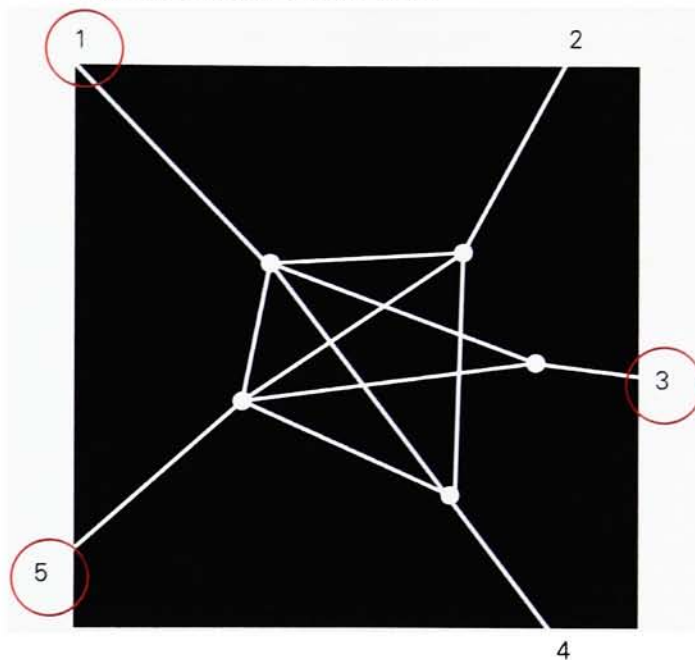
This traditionally invisible collaborative process will be presented visually on the following page to aid designers in understanding effective collaboration on complex design projects. The act of graphically communicating the collaborative process helped the designer comprehend which structure was necessary for the final application project.



## Collaborative Models

The diagram below represents the collaborative structure used in Will Burtin's *Upjohn Brain Exhibit*. The collaborative structure is a formative model, yet it is unique in detail in compared to the model on page 24. In the model below, the five classic disciplines merge to create new team structures all focused on the same goal: the teams are working toward communicating the connection between mind and behavior. Isolated studies are combined with other disciplines in an attempt to gain new insight, and foster innovative concepts which might not have otherwise been imagined.

For example, from the five classic disciplines illustrated below number one, Biology and Medicine, number three, Mathematics, and number five, Physical Science and Electricity have all been combined to stimulate new expertise in Cybernetics. Expertise in Cybernetics was a major factor contributing to the success of Will Burtin's light and video function communicating the pathway of a thought through the brain parts.

**Five Classic Disciplines**

- 1** Biology and Medicine
- 2** Chemistry
- 3** Mathematics
- 4** Psychology and Philosophy
- 5** Physical Science and Electricity

**Interdisciplinary Approaches to the study of Brain Functions**

- 1 + 4 Physiological Psychology and Psychobiology
- 1 + 4 + 5 Molecular Psychology
- 1 + 2 + 4 Psychopharmacology
- 1 + 2 Biochemistry
- 1 + 5 Electrophysiology
- 1 + 2 + 5 Molecular Neurology
- 1 + 3 + 5** Cybernetics

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Case Studies

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Case Study 2

The designer also examined Jan van Riemsdyk's *Obstetrical Forceps*, 1754 and Richard Saul Wurman's *Medical Access Book*, 1985. These two examples share identical communication goals concerning content. The comparisons across time offer the designer an opportunity to examine the benefits of effective collaborative structure.

Designer Jan van Riemsdyk collaborated with William Smellie and William Hunter who were both experts in the study of obstetrics during the 1700s. These obstetricians aspired to accurately describe the mechanical anatomical aspects of delivering a child in both common and complicated presentations. Smellie made significant improvements to the obstetrical forceps and needed Jan van Riemsdyk to visually communicate the clinical indications of their use. The graphic chosen illustrates the fetus as it is helped with the assistance of forceps as artificial hands when it is necessary to help the mother and child during the birthing process.

The main communication goals of this project were targeted to the practitioner to aid him or her in the use of the forceps. Although designer Jan Riemsdyk's graphical depiction of obstetrical anatomy was considered a remarkable success in earlier years, criticisms surfaced as contemporary designers began to compare it to Richard Saul Wurman's *Medical Access Book*, 1985. Please see the Appendix C for additional detail.



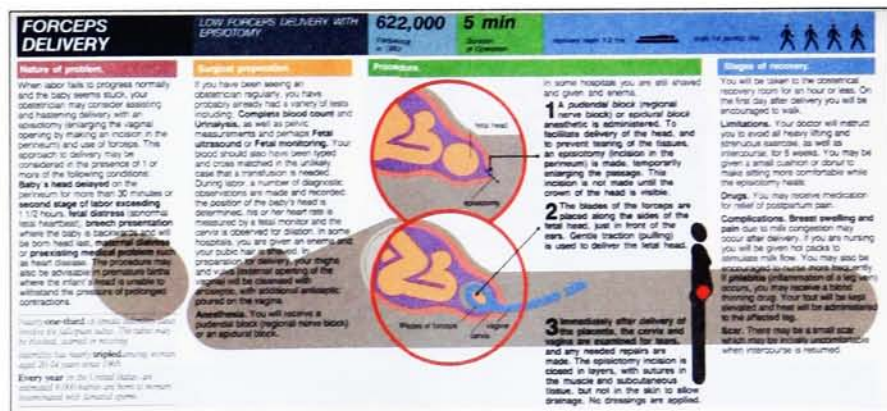
J. van Riemsdyk's  
*Obstetrical forceps*, 1754

## Case Studies

## Case Study 2

Designers Jan Riemsdyk and Richard Saul Wurman had the same communication goal, to visually describe the procedure of delivering a child through the use of forceps. Richard Saul Wurman participated in an interdependent collaborative effort with editors, writers, printers designers, photographers, physicians, nurses, type setters, surgical physicians, patients, researchers, administrators, support staff, various medical groups, architects, planners, consultants, and clients.

Through this collaboration Richard Saul Wurman was better able to communicate his message to the young medical practitioner and the patient. The nature of the problem, the need for consent, frequency of the procedure from an objective standpoint, surgical preparation, the procedure in proximity to the body, duration of the procedure, the expectation of pain, invasiveness versus non-invasiveness, potential scarring, traditional complications, and the stages of recovery were meaningful additional layers of information that resulted from the collaborative process. Please see the Appendix C for additional detail.



Richard Saul Wurman  
Medical Access Book, 1985

## Significance

Richard Saul Wurman was better able to communicate his message to the young medical practitioner and the patient through effective collaboration. The designer is confronted with an analogous design problem for the final application in this thesis study. Visually depicting the Pathophysiology of Tourette Syndrome similarly presents the challenge of trying to communicate to the medical practitioner and the clients who live with Tourette Syndrome. Insight is gained by comparing collaborative processes conducted on analogous projects. The designer recognizes the benefits of working in an interdependent team with all the individuals involved with the project.



## Conceptual development

## Mindmap 1

The use of Mindmapping helped to fully comprehend the Tourette Syndrome disorder. The designer used this tool to organically generate associations with the disease that otherwise may not have been considered. As the process unfolded, a range of different levels of nodes were generated and color-coded to identify connections. The tool was helpful to the designer in further comprehending the disease and in generating preliminary ideas for the application project.



## Significance

The mindmap has provided new insights for the designer and is the first ideation tool in the working process used to explore the final application. Assessment of a case of Tourette Syndrome involves far more than just a simple diagnosis. Symptoms may fluctuate in severity and character from hour to hour, therefore a thorough understanding of the patient may take a considerable amount of time. As the patient becomes more comfortable with a doctor, there will be less likelihood of symptom suppression or inhibition. Only when there is confidence in the physician is the patient likely to share their most frightening or bizarre symptoms or receive a diagnosis.

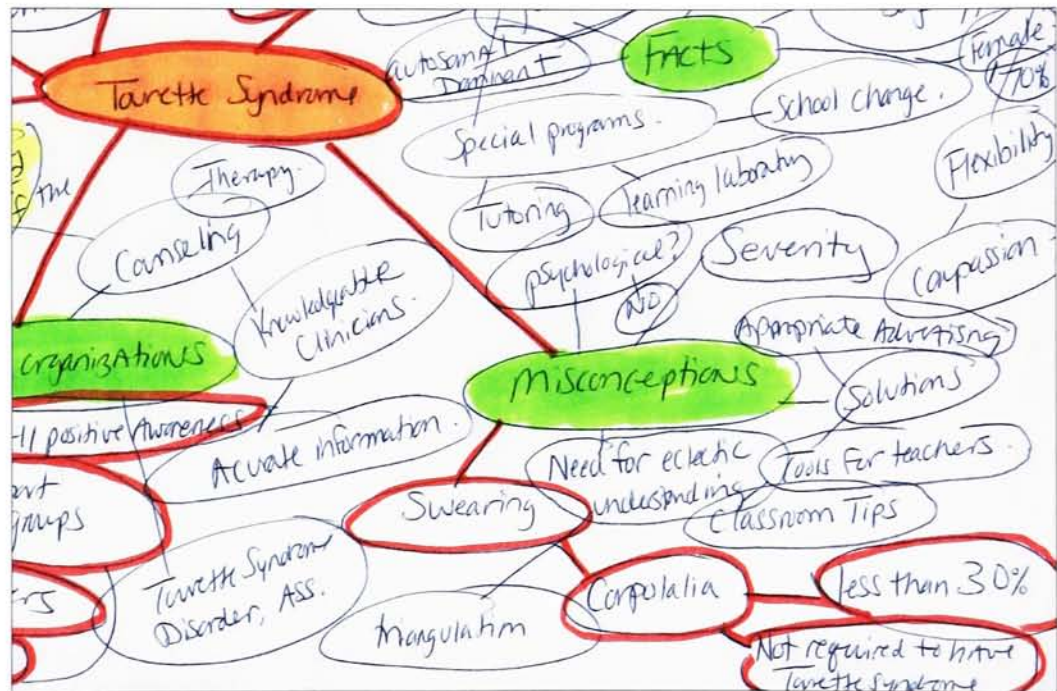
The mindmapping work has influenced the designer to consider developing an artifact to assist the doctor with a proper diagnosis and explanation of the disorder. The most useful artifact will serve the patient and the physician in understanding the range of symptoms while giving them confidence.



## Conceptual Solutions

## Mindmap 2

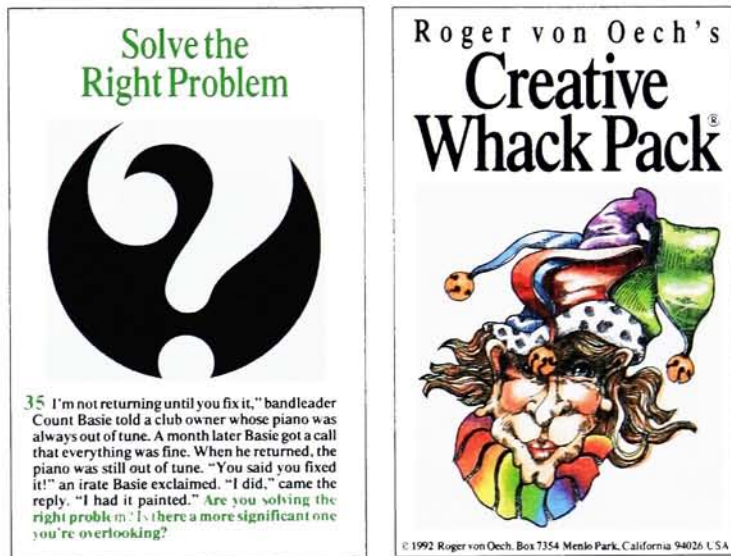
The second consideration generated from the mindmap for an application will focus on understanding the disorder. The designer has narrowed this to two potential communication goals. One consisting of what it is like to tic. The other, an effort to communicate that Tourette Syndrome is not always an extreme case as the media often portrays it to be.



## Conceptual Solutions

## The Creative Whack Pack

Roger von Oech's *Creative Whack Pack* was useful to the designer in the selection process for developing a single concept for the final application. This deck of cards is a brainstorming tool to help a designer get out of their habitual thought patterns and critique their ideas from a new perspective. There are 64 cards and each of them feature a new strategy. For example some of the cards will direct the designer to where they might find new information and others provide the designer with ways to conceptualize fresh ideas.



## Significance

The *Whack Pack* card above heavily influenced the designer to think about what was the most important factor for the Tourette Syndrome design solution. Communicating to an audience that ranged widely in familiarity, education, and age getting the audience to interact with each other was critical. This eclectic audience to interact with each other. The designer developed the idea of designing a traveling exhibit for Tourette Syndrome where individuals could interact and be exposed to pertinent information.

There are many topics and misconceptions that need to be communicated about Tourette Syndrome. Due to time constraints, the designer cannot implement a actual exhibit on Tourette Syndrome. Roger von Oech's *Creative Whack Pack* forced the designer to think critically about where focus should be. Based on the components and the process of the thesis thus far, encompassing research, synthesis, brainstorming, and external audits; the designer developed a team focused on visually presenting the non-visual neurological chemical imbalance that takes place in the brain of those who have Tourette Syndrome.

The focus of the final application involves the Pathophysiology of Tourette Syndrome. Precedents, previous investigation and synthesis, and a personal quest to better understand the root of the problem were also valid reasons that influenced the designer to focus on neurology.

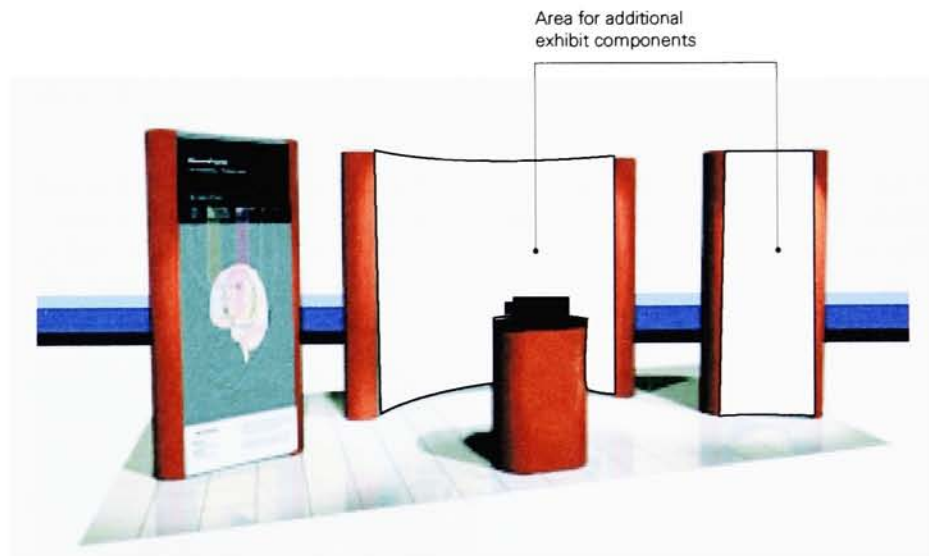
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Conceptual Solutions

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## Focus

The final application involving neurology will be presented in the thesis exhibition as one component of an overall hypothetical exhibit that communicates a range of communication goals for Tourette Syndrome to a diverse audience. Although the exhibit concept will be hypothetical due to time constraints, the designer will focus attention on one component of the exhibit which will be representative of a larger system of coordinated solutions.

**Tourette Syndrome Exhibit**

**Component:** Interactive Projection *The Pathophysiology of Tourette Syndrome*

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Conceptual Solutions

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**Flip Panel**

This diagram below demonstrates how a component of an exhibit can be transformed into another artifact and context to provide extended usage and awareness. In the exhibit, the information explaining the Pathophysiology of Tourette Syndrome would be projected onto the wall. The projections would be looped, periodically changing to explain specific neurological changes that occur in the brain which elicit particular tics.

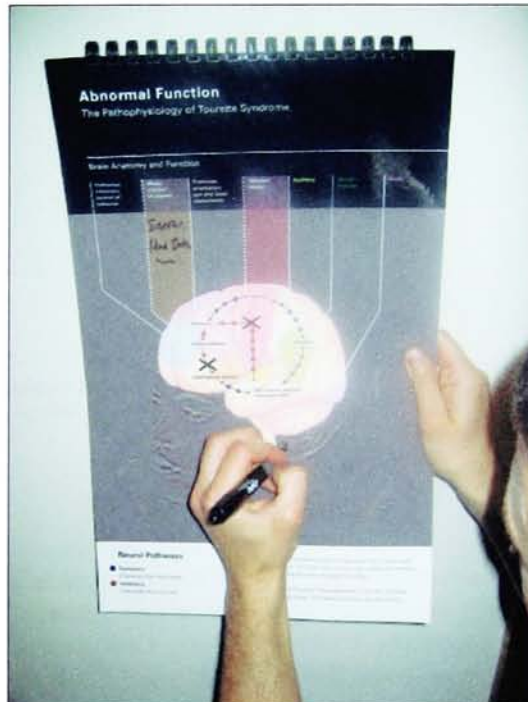
The flip panel below can be used in a medical office. It is intended to be flipped manually and can be adapted to accommodate a professional and the client. The flip panel sequence is analogous to the exhibit's interactive projection, yet it takes another form and offers users unique features. For example, the flip panel allows for a sequential unfolding of information over time and a glossy surface providing the physician, counselor, psychiatrist, or social worker with an opportunity to draw and write on the artifact.

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Significance

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The designer was able to concentrate on the broader needs of the design problem, fostering awareness for Tourette Syndrome. The concept of the exhibit design solution demonstrates how individual components within a larger solution can yield additional artifacts, thus satisfying the need for creating maximum awareness.



**Flip Panel**  
*The Pathophysiology of Tourette Syndrome*

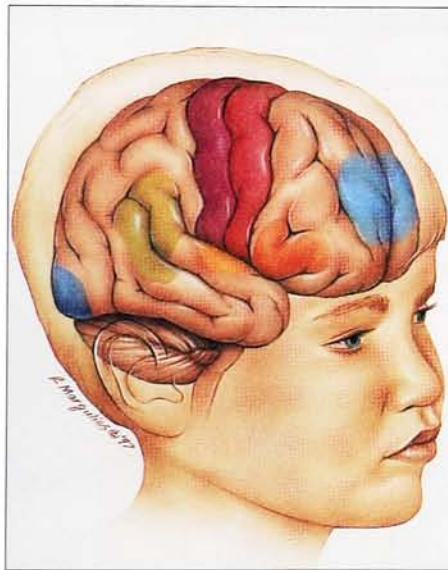


## Conceptual Solutions

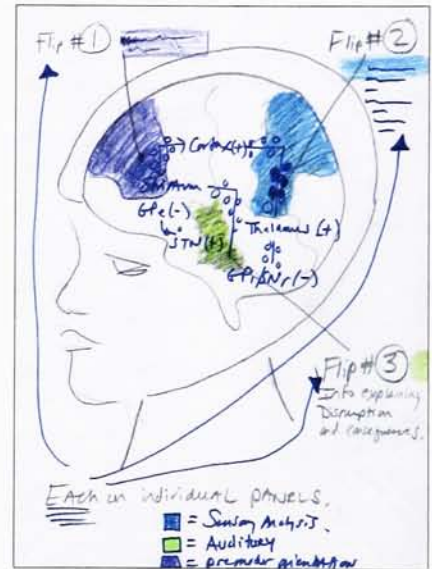
## Models

The designer worked in collaboration with medical illustrator, Jim Perkins, who provided the designer with resources and contact information for professional illustrators. The designer referred to similar medical and neurological design problems and was heavily influenced by particular examples which provided the viewer with the immediate context of the neurological problem. Please see the Appendices on page for specific examples.

The designer, having been influenced by this strategy, worked in an interdependent collaborative effort with medical illustrator Robert Margulies. The illustration below, illustrated by Robert Margulies, is the image that the designer has chosen to work with. The designer in collaboration with Robert Margulies obtained permission to alter the illustration for the purpose of visually communicating the pathophysiology of Tourette Syndrome.



**Robert Margulies**  
Medical Illustration



**Jill M. Kepler**  
Preliminary Sketch for final application

## Significance

Collaborating with Robert Margulies provided the designer with an opportunity to work with a strong image. The image's strengths satisfy the designer's needs, to provide a logical context for the neurological information that needs to be communicated. The image features a young boy, which also has a quiet significance, because the majority of Tourette Syndrome clients are young boys.

## Conceptual Solutions

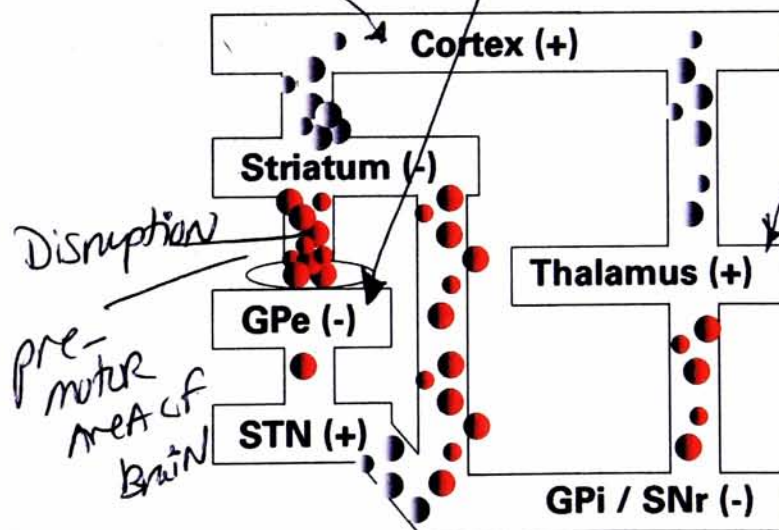
The designer begins to design a visual model communicating the neural pathways of those who have Tourette Syndrome using the research below. The final model will be used in the final application.

## Process

## NEURAL PATHWAYS

The basal ganglia are a group of forebrain structures that serve as a way station for neural pathways projecting from the cerebral cortex to the thalamus and back to the cortex. These parallel pathways appear to be somatotopically organized and minimally overlapping as they interconnect cortex, basal ganglia, globus pallidus, substantia nigra, and thalamus. They carry neural signals related to motor, somatosensory, cognitive, and emotional functions. Current understanding of the pathophysiology of TS and OCD suggests that a disruption of one or more of these pathways at any level disrupts the entire loop. Moreover, it has been proposed that the types of symptoms expressed depend on where and how the disruption occurs.

The striatum, composed of the caudate nucleus and putamen, is a functional subdivision of the basal ganglia (Fig. 74-1). It receives excitatory glutamatergic input from virtually all regions of the cortex. The input from

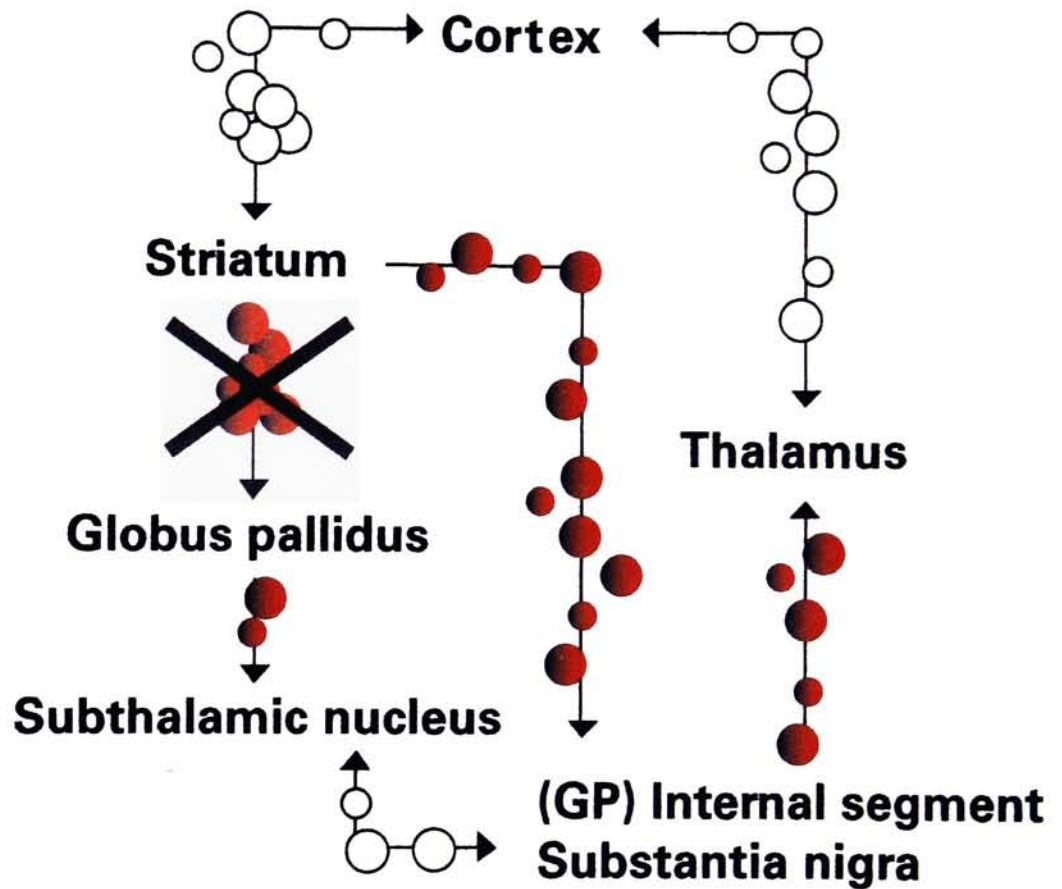


● = Inhibitory Neural Pathways.  
 ● = Excitatory " " "

## Conceptual Solutions

Based on the previous model, this model is simplified, and communicates a specific disruption in the neural pathways of those who have Tourette Syndrome. This model will be used on its own panel supported by a written explanation concerning the kinds of tics that it may yield.

## Process

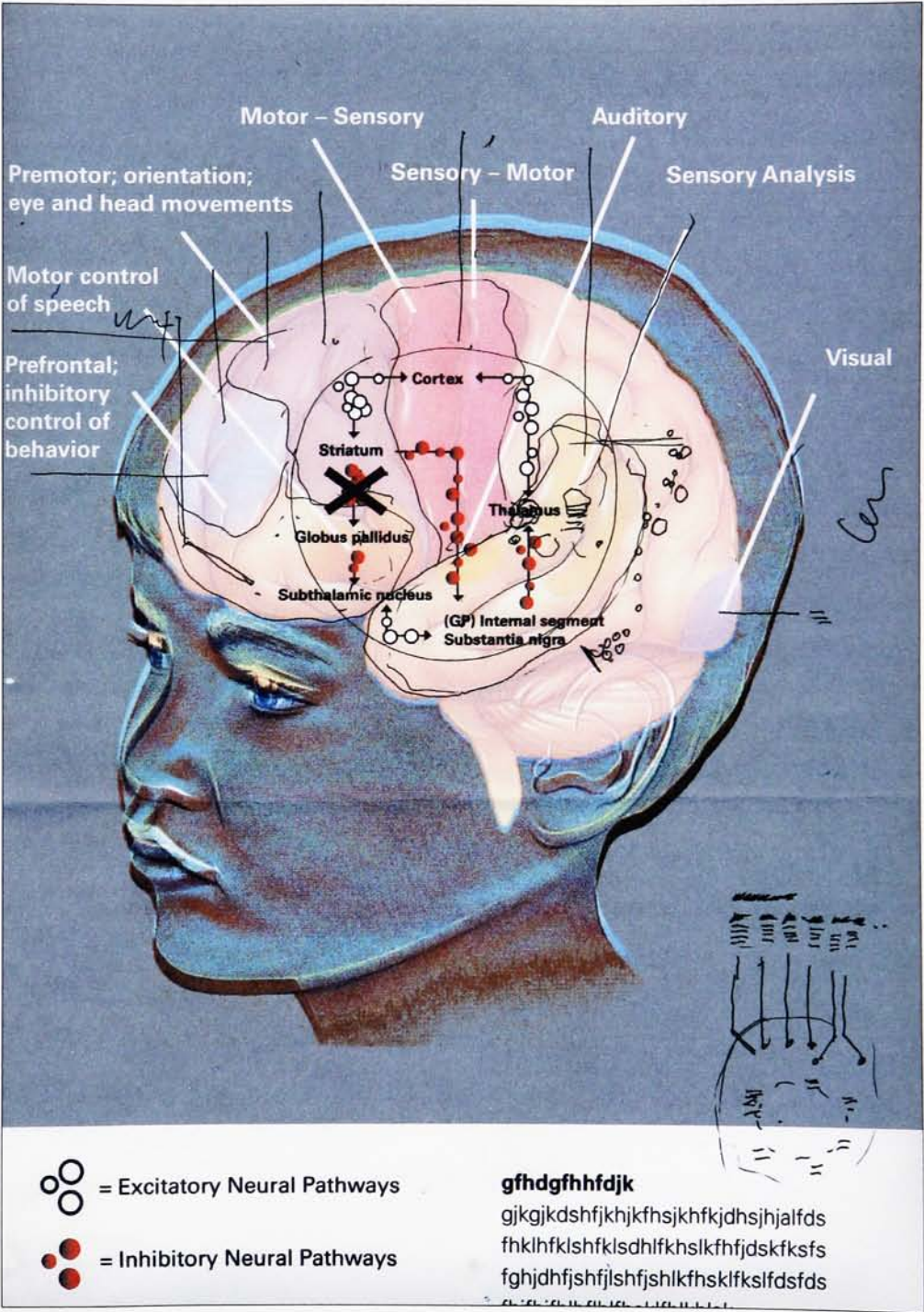




Conceptual Solutions

The designer begins to integrate the diagrammatic model with the illustration. The brain parts were strategically labeled and color-coded, allowing the viewer to correlate the disruption that occurs in the neural pathways with a specific brain part.

Process

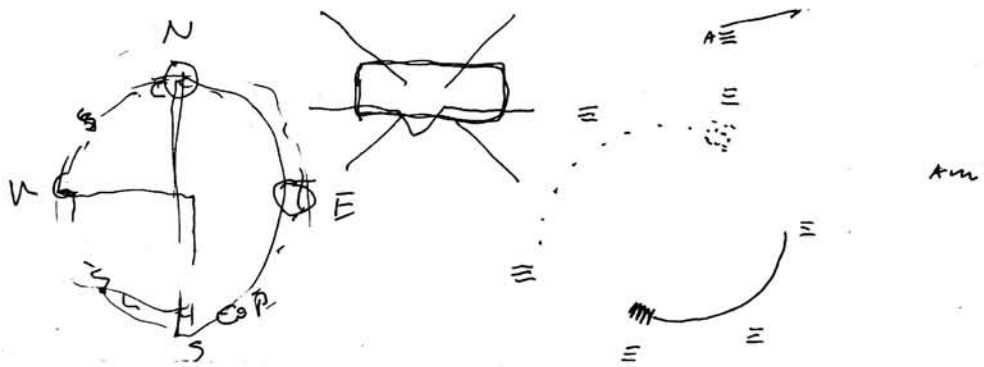




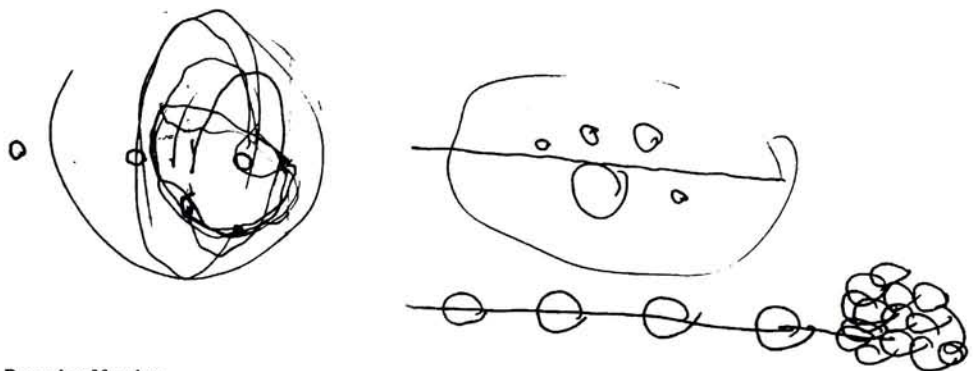
## Conceptual Solutions

The designer, in collaboration with Professor Bruce Ian Meader, discussed his thumbnail sketches concerning changes in the diagram that may yield clearer communication. The sketches influenced the results of the final model illustrated on the following page.

The sketches below influenced the designer to communicate the model in a circular format making it easier for the viewer to understand.



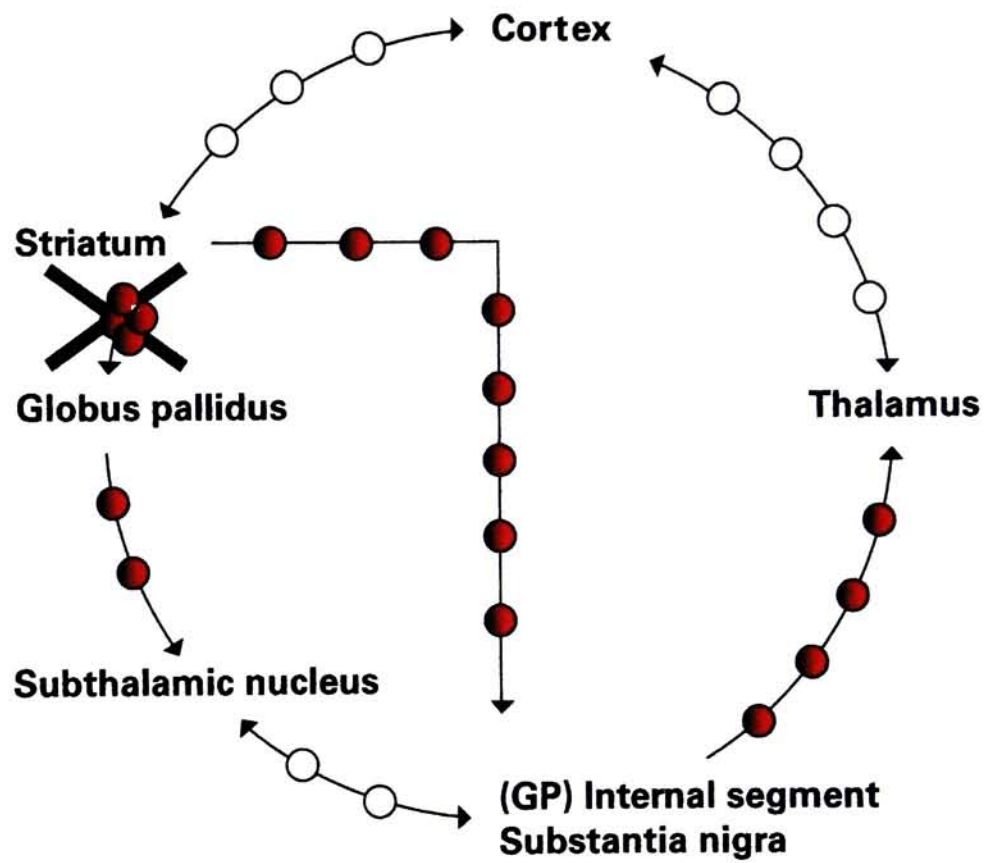
The circles representing the flow of the neural pathways were suggested to read more clearly if they were presented in a single linear row following the pathway. The disruption would then read more clearly as opposed to following a disruption that occurs at the end of a more organic pathway.



**Bruce Ian Meader**  
Thumbnail sketches

**Neurological Model****Final Model**

This is the final model of the neurological chemical process. Each model in the flip panel will represent a disruption in a specific area correlating with the brain part in the final application.



## Testing Strategies

**Preliminary**

**Thesis Content** Prior to implementation, the designer will perform a goal-referenced preliminary evaluation to assess whether or not specified objectives for team building are being met. Historical and contemporary case studies will be contrasted to evaluate the parameters of a design problem and how complex design problems can be better solved by breaking entrenched boundaries and working as part of a team.

**Outside Content** A survey will be conducted to foster understanding of the viewers/ users previous knowledge of Tourette Syndrome and their expectations for the project. A goal-free evaluation strategy will be used in an attempt to not impose evaluators' detailed goals and objectives before the start of the evaluation. This method is important because it gives the designer a good idea of the user's values and immediately rules out ideas in the preliminary stages that may be of little importance for the user.

**Intermediate**

**Thesis Content** Prior to the 2004 thesis exhibition interviews and questionnaires were conducted with the National Tourette Syndrome Association, doctors, health care physicians, teachers, students, designers, and individuals who live with the disease Tourette Syndrome. The questionnaire was used as a checklist to review the working team based organization.

**Outside Content** A flip panel will be used to reflect the ability of materials and elements (i.e. graphics, words, color, etc.) to communicate the message effectively. Doctors, health care physicians, teachers, students, designers, and individuals who live with the rare disease Tourette Syndrome will be exposed to the flip panel evaluation which will help foster effective communication. This evaluation technique will also be used for design solutions as they evolve and continue to develop.

The main objective of this strategy is to distinguish strong design solutions from weak design solutions, uncover areas of ambiguity, and evaluate clarity of communication goals and concepts. The designer will cooperatively discover subproblems and unaddressed needs through the evaluation. A prototype will be used to evaluate the effectiveness of an idea before final implementation. Weekly evaluation meetings with the chief advisor and periodic committee meetings with associate advisors will be included for evaluation purposes.

**Tourette Syndrome Association**

The designer is working in collaboration with the Tourette Syndrome Association and the association has forwarded the designer a packet of requested information based on the needs of the thesis project. The packet contained a list of professionals that have stated that they are very much interested in assisting people with Tourette Syndrome. Psychologists, Social workers and counselors in New York State were listed. The designer contacted several of the professionals and made appointments to visit their practice view and converse about the numerology of Tourette Syndrome.



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Interviews

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**Eugene McCabe, Psy.D.**

Dr. Eugene McCabe, a psychologist in Rochester, New York and his current colleague/intern were interviewed by the designer. Since psychologists often work with children and families who live and cope with Tourette Syndrome the designer was especially eager to present the concept and solicit their intermediate feedback. The designer is happy to report that Dr. Eugene McCabe and his intern were favorably impressed. Dr. Eugene McCabe and his intern, although they spoke only for themselves, thought that many other psychologists, including social workers, would accept and benefit from a visual aid to explain the neurology of Tourette Syndrome.

Dr. Eugene McCabe and his intern have urged the designer to give some attention to the clarification of medical terminology, which was abbreviated in the initial design. The viewers remarked that parents may inquire what the abbreviations meant and concluded that the designs would be more useful for them if they were able to give the patient concrete answers. The designer also reviewed several other details concerning the designs and the intern suggested that the design may not be appropriate for all diagnostic patients depending on their mental state of inquiry at the time of their visit.

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**Peter Como, Ph.D.**

The designer had a meeting with Dr. Peter Como at The Tourette Clinic Department of Neurology in Rochester, New York. The conference with Dr. Peter Como certainly must be accounted as one of the most important of the series that the designer has been conducting on the Neurology of Tourette Syndrome project. Dr. Peter Como is an experienced Neuropsychologist with a specialty code-EVAL, CHIL, EDU, FMLY, BHVR. Dr. Como has been diagnosing and counseling children and families who live with Tourette Syndrome for over twenty years. Dr. Como was not enthusiastic about the designs that were presented to him, and subjected the designs to very sharp criticism. This was a very valuable and constructive process at this particular stage in the design process, in fact, it is exactly through such criticism that the project was perfected.

Dr. Peter Como was very cautious about the molecular and genetic theory which was presented in the design. This research was found at the Minor Medical Library at the University of Rochester. Dr. Como was familiar with the data that the designer has made visual, however he felt that the present research was not conclusive. As a case in point, Dr. Peter Como has his own theory of *Neuropsychological Function in Tourette Syndrome*. Dr. Como also works very closely with Dr. Jonathan W. Mink who wrote a chapter on *Neurobiology of Basal Ganglia Circuits in Tourette Syndrome: Faulty Inhibition of Unwanted Motor Patterns?*; a text which the designer was suggested to read. To conclude, current research on the Neurology of Tourette Syndrome is in its present state controversial.

Dr. Peter Como feels that because the present research is not conclusive and scientifically proven that it would not be appropriate to make the information visual for the parent and child. Dr. Como remarked that the information would be a great value for medical students who are learning about the Neurology of Tourette Syndrome. It is of great interest that Dr. Como has identified another audience who may benefit from the design. The interview has informed the designer of the importance of visually communicating multiple theories and addressing the needs of more than one target audience.



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**Interviews**

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**Jim Perkins**

The designer interviewed Jim Perkins, a well known medical illustrator who teaches at the Rochester Institute of Technology. The issue of presenting research and theoretical study, which is not scientifically proven was discussed. Jim Perkins articulated that the detailed factual information which is acquired is sometimes a preliminary step towards understanding clinical aspects of motor disorders. Medical illustration should provide the user with a clear, concise, and user friendly summary. Jim Perkins stated that if a designer can enable the viewer to see the big picture, then they may be better able to layer on the necessary detail that ultimately completes their understanding. Jim reiterated that choosing not to design for current research on the basis of it not being proven or widely supported by all physicians would be a mistake. Moreover, designs should be updated appropriately as the research is compounded and reaffirmed. Visual communication enhances learning therefore increases the possibility for further inquiry and scientific discovery. The designer finds value in this ideology and decides to communicate the most current neurologic theory concerning Tourette Syndrome.

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**Parents / Patients**

Bob Barbato, Jeanne M. Kepler and Judy Kepler whose children have Tourette Syndrome were interviewed. Parents value the concept and believe that the visual aid will help make a complex topic understandable. The intermediate feedback obtained enabled the designer to conceive of a redesign for the artifact. The nature of the problem was proposed to be more understanding if it was presented in a sequence.

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**Significance**

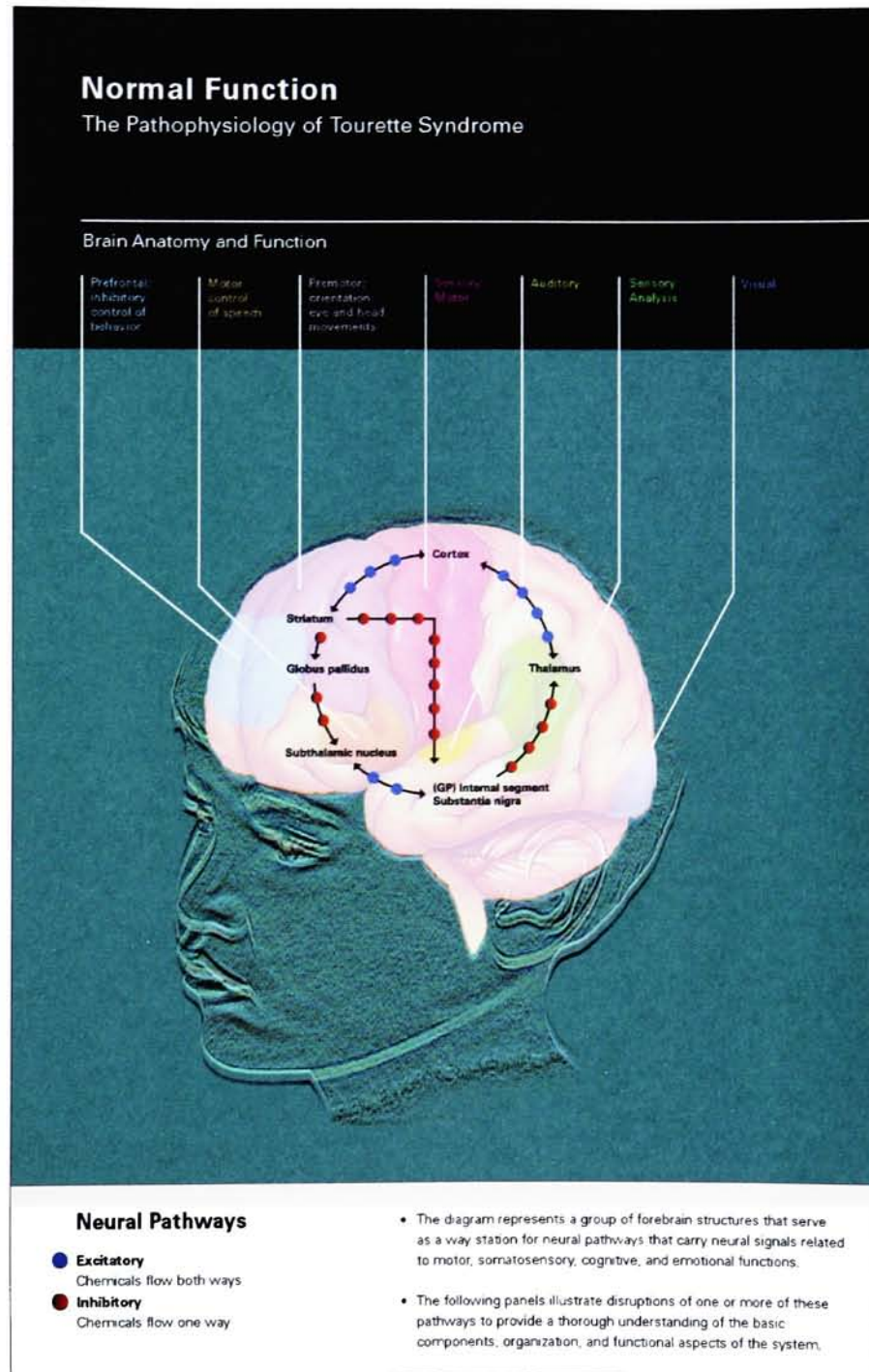
In two respects it is more urgent to satisfy the Psychologists, Social Workers, Counselors and Parents rather than the Physician. The laymen are accustomed to more abstraction and are not bothered by a lack of exact literalness. Second, the laymen are at a much greater disadvantage when it comes to articulating the nature of the problem. The designer has concluded, based on interviews, that the layman to neurology would prefer symbolic, systematic presentations. Neuropsychologist with a vested interest in contributing to their fields insist on something more factual and detailed.

The designer's impression, based on interviews is that neuropsychologists believe that the designs should serve their domain. This obviously requires the designer to carefully conduct and select research. The designer is at a loss as to which theories to support, hence the designer has chosen to design for the most current, supported scientific theories. This will allow the professional to present the most up to date information to their clients.

## Final Artifact

This is the first flip panel of the thesis' final application. The panel explains and allows the viewer to visualize the normal brain anatomy and function. This will help the viewer in the next series of panels understand the abnormal Pathophysiology of Tourette Syndrome.

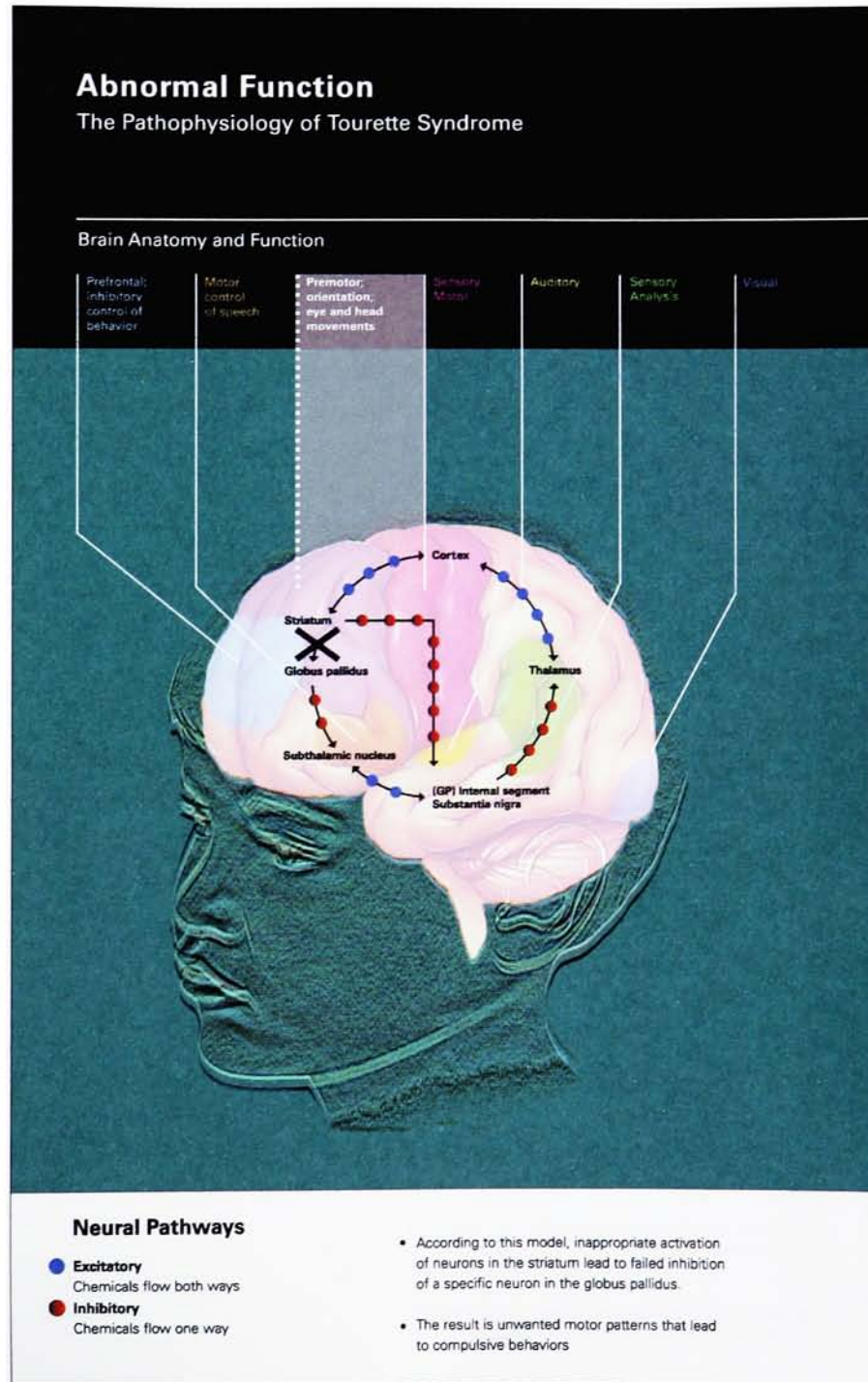
## Flip Panel 1



## Final Artifact

This is the second panel of the final application. According to this panel there is a disruption in the globus pallidus resulting in unwanted motor patterns that lead to compulsive behaviors. The viewer will begin to understand the nature of specific tics and why the tics may wax and wane and suddenly change.

## Flip Panel 2

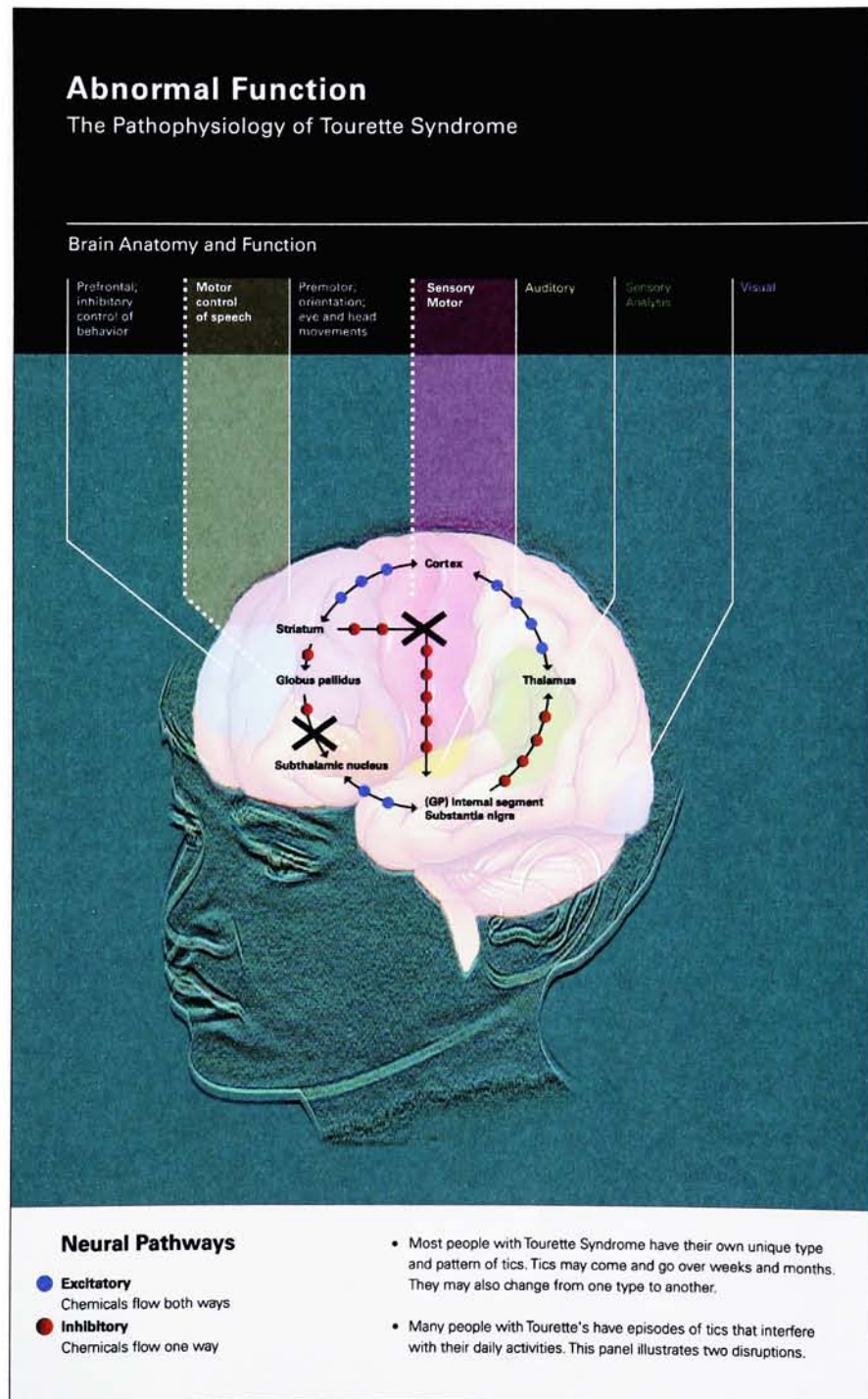




## Final Artifact

This is flip panel three of the thesis' final application. This panel illustrates two disruptions allowing the viewer to understand that most people with Tourette Syndrome have their own unique type and pattern of tics. Tics often come and go over weeks and months. They also change from one type to another, this panel helps the viewers to understand the nature of the disorder.

## Flip Panel 3





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Presentation panels explaining the thesis project were displayed in the RIT Bevier Gallery from March 29, 2004 through April 14, 2004. These panels included an introductory panel, which stated the thesis study's objectives and summarized the thesis outside content involving Tourette Syndrome. The designer exhibited four graphic interpretations of collaborative structures and the viewer was able to read a short description pertaining to each model. Accompanying one of the collaborative structures was the thesis final application on the last panel. An explanation of the thesis application was also included on the last panel. An explanatory collaborative diagram was strategically placed above the final application projection to show the parallels between the final artifact and the collaborative structure, which took place during the development of the application.

Several options exist concerning the future dissemination of the thesis final application. The hypothetical exhibit containing a variety of components all focused on creating awareness for Tourette Syndrome would be a traveling exhibit supported by the Tourette Syndrome Association. The final flip panel artifact which communicates the pathophysiology and symptomatology of Tourette Syndrome will be disseminated to physicians, psychiatrist, social workers, and counselors. The artifact could also be adapted into a presentation format to accommodate medical students who are studying the neurology of Tourette Syndrome.

The ultimate goal of the dissemination plan is to use and study the strengths and weaknesses of pioneering exhibition designers who have been successful at grant writing. The purpose of this is to further develop the necessary knowledge and skills to successfully present this idea to an organization and obtain the necessary funds to implement an exhibit on Tourette Syndrome and apply the thesis collaborative theory.

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Assessment

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Upon completion of this thesis study, several strengths and weaknesses became apparent. The designer has critically assessed the thesis process and has found strength in the thesis project definition stage of the project. This process forces the designer to formulate a problem statement and define the thesis mission, goals, objectives and strategies. The thesis is titled *Interdisciplinary Collaboration in Graphic Design* with the outside content of Tourette Syndrome; the thesis application is a flip panel intended to be used by doctors, physicians, psychiatrists, counselors, parents and children, to explain the neurology and symptomatology of Tourette Syndrome. This flip panel is articulated in the thesis documentation to be an extension of a larger system of coordinated solutions focused on creating awareness for Tourette Syndrome. This extension represents how a single design component taken from an exhibition can provide additional communication and value.

In spite of the aforementioned complexities of the thesis' outside content and design solution, this particular section of the thesis has been a strength, for it allowed the designer to stay focused on the goals of the thesis concerning interdisciplinary collaboration. The design found great value in meeting all of the objectives and goals of the thesis as she traveled through the thesis process.

The main weakness occurs in the design application and are a result of time constraints. Although the idea of an exhibition surfaced during the beginning stages of the thesis, a greater effort should have been exerted on developing other possible design application ideas, which were more manageable given the necessary time table of the thesis. Typically, the design and development of an exhibition takes a number of years. The designer found it very challenging to articulate this hypothetical concept through one component and communicate the collaborative process of both.

In spite of the weaknesses mentioned above, the thesis project is a success. The design application achieved the goals of communicating the pathophysiology and symptomatology of Tourette Syndrome. It also succeeded in revealing the benefits of interdisciplinary collaboration in graphic design by documenting the collaborative process. The artifact would not have been a success without the participation of outside expertise and numerous others involved. Through interdependent teamwork the flip panel succeeded in gaining the interest of its targeted audience and also gained the interest of medical students who are eager to learn more about the neurology of Tourette Syndrome.

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**Assessment**

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This graduate thesis project has proven to be a challenging, yet rewarding and educational experience. Finally, the designer was able to demonstrate the importance of designers and multidisciplinary groups working together throughout the development of a design project. The designer chose the outside content of Tourette Syndrome, which kept the designer engaged with research. As the thesis project continued to progress, the designer found great satisfaction in reflecting back on the mission, goals and objectives, as they were fulfilled.

The designer developed a visual guide for collaborative structure and was able to inform and educate others about the complexities and benefits of collaboration. Being able to do this in a way, which they can easily interpret and learn about, has been rewarding. Most of the individuals and other universities who evaluated the thesis project were very interested and went away with a greater knowledge of the collaborative structure.

It has been apparent that designers have always used the technique of collaboration as a means of enhancing a design project to make it more attractive, informative, and visually interesting. However, not all designers who engage in collaboration understand its complexities. To this end, the designer has identified the difference between collaboration and contribution. The designer has carefully examined words relating to collaboration and correlated them with appropriate collaborative structures allowing the designer to formulate and theorize the benefits of collaboration and comprehend its complexities. The thesis also includes documentation of issues regarding collaboration from experiential perspectives and includes the identification of variables that identify successful collaborative work.

All in all, this contributes positively to the graphic design discipline and many other fields by enabling them to clearly understand and recognize collaborative structure. The true benefits of collaboration can accrue only if its capabilities are understood and managed properly. This thesis will enable individuals to better understand and manage collaborative structures.



## Thesis Based

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Term	Definition
<b>Advance Organizer</b>	Advance or pre-organizers offer information on conceptual and topographic orientation. They can be provided by staff, posters, kiosks, self-testing devices, headline questions, films, computers, videodiscs, flip panels, and other means.
<b>Attracting power</b>	The ability of an exhibit to attract the attention of visitors usually is measured as ratio of the number of visitors who stop at an exhibit to the total number of visitors who pass by this exhibit. For example, if 10 out of 20 people stop at an exhibit, the attracting power is 50 percent.
<b>Cued testing</b>	Method of formal analysis when subjects are aware they are to be observed and questioned; reflects ability of materials to communicate under motivated conditions.
<b>Collaboration</b>	The act of people working jointly and demonstrating flexibility and a shared sense of vision and mutual trust.
<b>Conceptual orientation</b>	An overview of what can be seen, done and learned, a brief information about exhibits.
<b>Elements</b>	The parts, components or variables of form within a format.
<b>Evaluation</b>	The most basic purpose of all graphic design methodology is to develop the knowledge, skills and sensitivities to be able to decide what is and is not working in the problem-solving situation.
<b>Flip panel</b>	Interactive label; viewers answer questions by choosing and lifting one of several hinged flip panels that depict correct/incorrect photos, objects, statements etc.
<b>Form</b>	The characteristics that distinguish one visual mark from another, including shape, size, color, and texture.
<b>Format</b>	The space in which an image lives and works. In determining formats, the designer needs to be conscious that in its most basic sense, the format is communicating a message by itself.
<b>Function</b>	The purpose for which all graphic design form exists. Function means design that works for its intended purpose.
<b>Goal-free evaluation</b>	Evaluation that is shaped from the information collected; attempts to not impose evaluators' goals and objectives before the start of the evaluation.
<b>Goal-referenced evaluation</b>	Evaluation undertaken to assess whether or not specified objectives are being met.



## Thesis Based

Term	Definition
<b>Autonomous</b>	The decision is made by the leader alone
<b>Consultative</b>	The decision is made by the leader with advice from the team members.
<b>Delegated</b>	The decision is made by the team within parameters specified by the leader.
<b>Holding power</b>	A measure of time spent viewing an exhibit. Often used as a ratio of average viewing time by uncued visitors. The quotient of the mean viewing time and the minimum time needed, e.g. the length of the program, also is referred to as the program's holding power. For example, if the required minimum viewing time of an exhibit is 30 seconds and a person stops for 10 seconds (actual viewing time), the holding power is 0,33.
<b>Interaction</b>	Any movement associated with gaining better comprehension such as stepping closer, touching, discussion, and use of the senses.
<b>Interdisciplinary</b>	Drawing from or characterized by participation of two or more fields of study.
<b>Joint Collaboration</b>	The decision is made by the team members and leader together through consensus. This means the decision is not made until both the team members and leader can actively support it, even if it is not their first choice.
<b>Knowledge gain</b>	The retention of previously learned material and the ability to grasp the meaning of the material.
<b>Leftover technique</b>	Method of indirect observation using traces like pieces of litter, fingerprints, photos, video and audio recording.
<b>Mindmapping</b>	An intuitive brainstorming tool that is used to generate various associations around one central concept, this process is used to generate associations that would otherwise not be considered.
<b>Mock-up</b>	Prototype, model; an inexpensive simulation of an exhibit or object often used during formative evaluation in order to determine its effectiveness before a final exhibit is completed.
<b>Module</b>	Refers to a spatial unit in any organizational method. A module may be regular (as in a typographic unit grid) or progressive (as in the proportional grid).
<b>Remedial evaluation</b>	The term refers to a post-design evaluation with the intention of improvement.
<b>System Theory</b>	An approach concerned with conceptual, color image, spatial, typographic, and language systems.
<b>Tracking</b>	Direct observation of visitor behavior throughout an exhibit area or facility to find spatial, temporal and behavioral patterns. It gives a more complete picture of the visitors' behavior than does focused observation as they move through the facility.
<b>Triangulation</b>	This term refers to the ability of some person or object to promote social interaction between viewers who otherwise would not interact.

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**Outside Content**

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<b>Term</b>	<b>Definition</b>
<b>Attention Deficit Disorder</b>	Disorder characterized by a short attention span, impulsivity, and in some cases hyperactivity.
<b>Autosomal dominant</b>	A pattern of genetic inheritance where only one abnormal gene is needed to display the trait or the existence of the disease.
<b>Coprolalia</b>	The involuntary expression of obscene words or phrases.
<b>Coprophaxia</b>	The involuntary display of unacceptable/obscene gestures.
<b>Decreased penetrance</b>	Individuals who inherit a changed disease gene but do not develop symptoms.
<b>Dysphoria</b>	Feelings of anxiety, restlessness, and dissatisfaction.
<b>Echolalia</b>	Involuntary echoing of the last word, phrase, or sentence spoken by someone else or sound in the environment.
<b>Echopraxia</b>	The imitation of the movement of one individual by another.
<b>Neurotransmitter</b>	Chemical in the brain that transmits information from one nerve cell to another.
<b>Obsessive compulsive disorder (OCD)</b>	Disorder characterized by persistent, intrusive, and senseless thoughts (obsessions) or compulsions to perform repetitive behaviors that interfere with normal functioning.
<b>Phalilalia</b>	Involuntary echoing of the last word, phrase, sentence, or sound vocalized by oneself.
<b>Tic</b>	Brief and intermittent involuntary movement or sound.

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**Resources**


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**Websites**
**[www.exploratorium.edu/exhibit\\_services/ebtp/teach/media/design\\_points.pdf](http://www.exploratorium.edu/exhibit_services/ebtp/teach/media/design_points.pdf)**

Discusses the educational outcomes of museum exhibits and focuses on the difference between information based exhibits and experienced based exhibits. In conclusion the article offers advice on how to design exhibits that engage the viewers. (April, 2004)

**[www.zoolex.org/glossary.html](http://www.zoolex.org/glossary.html)**

The website is dedicated to pre-design, evaluation, and pretesting before an exhibit receives exposure. (April, 2004)

**[tourette@ix.netcom.com](mailto:tourette@ix.netcom.com).**

National Tourette Syndrome Association, Inc. 42-40 Bell Blvd., Bayside, NY 11361-2820. (718) 224-2999. Fax: (718) 279-9596. [tourette@ix.netcom.com](mailto:tourette@ix.netcom.com). Dedicated to awareness. (April, 2004)

**<http://neuro-www.mgh.harvard.edu/forum/>**

The Neurology WebForums site is useful for the designer for anyone can read all of the posts. Accessible posts allow the designer to evaluate conversations that are being discussed in the chat room concerning the topic of Tourette Syndrome Neurology. (April, 2004)

**[http://www.neurology.org/cgi/collection/tourette\\_syndrome](http://www.neurology.org/cgi/collection/tourette_syndrome)**

Contains a variety of collected resources on the Neurology of Tourette Syndrome allowing the designer to contrast and compare literature and other theories found elsewhere.

**<http://neuro-www.mgh.harvard.edu/brainconnections.html>**

Contains pointers to organizations that provide information on brain disorders. (April, 2004)

**<http://www.ninds.nih.gov/>**

The website features the National Institute of Neurologic Disorders. The site linked to Tourette Syndrome gives the designer a macro view, an abstract of the current research that is being conducted concerning Tourette Syndrome. (April, 2004)

**<http://search.epnet.com/direct.asp?an=9708194422&db=afh>**

This article provides the designer with guidelines for the process of securing funding for projects. Using a proactive approach, the article aids the designer in identifying key ingredients of successful proposals: demonstrating need, describing the project, proving organizational capability, explaining finances, and how to properly document past successes. (April, 2004)

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**Books**

Austin, James E

**The Collaboration Challenge: how nonprofits and businesses succeed through strategic alliances.** San Francisco, California: Jossey-Bass Publishers (2000).

Describes how nonprofit and businesses succeed through strategic alliances. The book provides the designer with perspectives on collaborating successfully when funding is an issue.

Cohen, J. Donald  
Goetz, G. Christopher  
JanKovic, Joseph

**Advances in Neurology: Volume 85**

Philadelphia: Lippincott Williams and Wilkins (2001).

Two chapters in this book are useful to the designer: Neuropsychological Function in Tourette Syndrome by Peter G. Como and Neurobiology of Basal Ganglia Circuits in Tourette Syndrome: Faulty Inhibition of Unwanted Motor Patterns. Both of the chapters were used to compare against other recent published claims.



## Resources

## Books Continued

Felton, L. David  
Jozefowicz, F. Ralph

**Netter's Atlas of Human Neuroscience.**

(First Edition). Teterboro, New Jersey: Icon Learning Systems (2003).

The book provides the designer with contemporary visual examples depicting both regional and systematic neuroscience with updated information of the many regions and systems of the brain. The book is a useful tool for the designer to acquire a good working knowledge of the nervous system which will enable her to communicate the neurological chemical imbalance in the brain associated with Gilles Tourette Syndrome.

Gerritsen, Frans

**Theory and Practice of Color: a color theory based on laws of perception.**

New York: Van Nostrand Reinhold (1975).

An extensive explanation of the phenomenon of light and color, historical conceptions of light perception, and color usage.

Hansen, T. John  
Koeppen, M. Bruce

**Netter's Atlas of Human Physiology**

(First Edition). Teterboro, New Jersey: Icon Learning Systems (2002).

The book provides a clear, summary of the major principles of organ system physiology. A valuable precedent in terms of successful medical illustrations that strategically leverage an obtuse visual approach predicted on the idea that once the viewer is exposed to the big picture, they are better prepared to layer on the necessary detail that ultimately completes their understanding.

Heller, Steven  
Pettit, Elinor

**Graphic Design Timeline: A Century of Design Milestones**

New York: Allworth Press (2000).

Graphic Design History is related in chronological order. By studying the two-page spreads dedicated to each year the designer was better able to locate and track down occurrences and projects relative to the thesis.

Johnson, Micheal

**Problem Solved: A Primer in design and communication.**

London: Phaidon (2002).

Gives valuable insight on how to better communicate as a designer.

Kusters, Christian  
King, Emily

**Restart: New Systems in Graphic Design**

London: Thames and Hudson (2001).

Discusses cross-disciplinary themes in contemporary graphic design, describes the expanding horizons of the profession.

Marcus, Aaron

**Graphic Design for Electronic Documents and User Interfaces.**

New York, New York: ACM Press; Reading, Mass.: Addison-Wesley (1992).

This book is a tool for interface design, usability, and navigational examples.

Mohrman, Susan Albers

**Designing and Leading Team Based Organizations:**

**A workbook for organizational self study.** San Francisco: Jossey-Bass Publishers (1997).

This book is a tool for design and diagnosis of team based organizations.

Remington, Roger  
Hodik, Barbara

**Nine Pioneers in American Graphic Design.**

Cambridge, Massachusetts: MIT Press (1989).

This book is a tool for locating valuable case studies for precedents.



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**Resources**


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**Books Continued**

Von Glinow, Mary Ann  
McShane, Steven

**Organizational Behavior: Emerging Realities for the Workplace Revolution.**  
(Second Edition). New York, New York: McGraw-Hill Companies, Inc. (2000).

Emerging realities for the workplace revolution including team dynamics and motivation.

Tomlinson, J.D.W.  
Roberts, K.B.

**The Fabric of the Body: European Traditions of Anatomical Illustrations.**  
Oxford, New York: Clarendon Press (1992).

European Traditions of Anatomical Illustration. The book allowed the designer to evaluate the graphical epitome of obstetrical anatomy in the late 1700's. A comparison of similar medical contemporary communication frameworks and goals were fostered.

Stankowski, Anton

**Visual Presentation of Invisible Processes.**

London, Tiranti: La Fonction Et Sa Représentation Dans Le Dessin Publicitaire (1967). (p. 55-60)

A great reference on how to illustrate invisible processes in Graphic Design, the book serves as a valuable precedent for the designer in communicating a non visual brain disorder and may help in visually presenting non visual collaborative structures.

Westwood, B. William

**Medical Illustration: Sourcebook 11 and 13.**

(Eleventh Edition). Santa Barbara, California: Serbin Communications, Inc. (1998).

Includes natural science, illustration and healthcare photography. Both editions are valuable resources for the designer in terms of a comprehensive visual resource which features a whole spectrum of styles and specialties in one source for the designer to learn from, critically analyze and draw inspiration.

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**Journals**

Wood, J. Donna  
Gray, Barbara

**Journal of Applied Behavioral Science: Toward a Comprehensive Theory of Collaboration**

An overview of theoretical and empirical perspectives on the process of collaboration and the forms of collaborative alliances. The article also aids the designer in addressing the preconditions, processes, and outcomes of collaboration.

Robertson, M. M.D.  
Stern, J.S. M.D.

**Euro Child and Adolescent Psychiatry 2000: Gilles de la Tourette Syndrome: Symptomatic Treatment Based on Evidence**

Addresses causality clinical characteristics, psychopathology and associated behaviors. The article is useful for the designer for it summarizes the most recent research findings and focuses on the latest medical treatments.

Shimberg

**Coping with Tourette Syndrome, A Parent's Viewpoint**

Addresses common concerns and feelings of parents. Covers parent and child relationships, and the impact of the diagnosis on siblings and other family members. The journal is useful for the designer in terms of evaluating and understanding appropriate timing for the use of the artifact; the interpretants sensitivity and readiness to work with the visual aid.

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**Resources**

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**RIT Archives****Various Materials**

Valuable in locating rare documents such as office records revealing detailed information about team members, financial records, grant work, process work, etc. for design precedents.

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**Videos**

Cohen, D. M.D.

**Tourette Syndrome: Developmental Psychopathology of a Model Neuropsychiatric Disorder of Children**

Provides an in depth look at Tourette Syndrome genetics and neurobiology. The author conveys case histories from 1990 of two different TS families and articulates the theoretical workings of the mind. The video is useful for the designer to identify correlation and advances in current theories.

Laurel, Chiten

**Twitch and Shout**

This documentary presents a series of interviews with adults who have been diagnosed with tourette syndrome but who are now able to participate in normal living experiences.

Stonfield, James

**Stop It, I Can't**

Explains exactly what it is and how it can affect children. Question and answer sessions with actual afflicted children help to convey the feelings they have over their misunderstood disease.

Precedent Examples



Macro view of the urban observatory  
detailed on page 12.



Micro view of map illustrating one of the  
city school districts.



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**Grant Applications  
Process Research**

# Grant Applications Process Research

The designer found value in conducting research and evaluating the collaboration that is necessary to gain funding for design projects. The designer has located examples below where negotiations, grant work, and various financial concerns were all part of the collaborative process.

The research and documentation will provide the designer with structure and insight for developing an effective grant application for the proposed exhibit focused on creating awareness for Tourette Syndrome. Due to time constraints, the designer will implement the grant application and submit the materials after graduation.

## Grant work Richard Saul Wurman

A grant application for Richard Saul Wurman's proposed project *A Guidebook to Guidebooks*.

Design Arts		Individual Grant Application Form NEA-2 (Rev.)	
<p>Three clear copies must be submitted to: Grants Office/DAP, National Endowment for the Arts, Nancy Hanks Center, 1100 Pennsylvania Avenue, N.W., Washington, D.C. 20506</p>			
1. Name (last, first, middle initial) WURMAN, RICHARD, S.		4. U.S. Citizenship <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
2. Mailing address/phone		5. Professional field or discipline Graphic Design & Urban Design	
3. Category under which support is requested: <input checked="" type="checkbox"/> Distinguished Designer Sabbatical Fellowships <input type="checkbox"/> Individual Project Fellowships <input type="checkbox"/> Entering Professional Designer Project Fellowships		7. Period of support requested: Starting March 1 85 Ending Feb 28 86	
6. Description of proposed activity (Complete in space provided. DO NOT reduce copy or continue on additional pages.) TITLE (Please underline): <u>A GUIDEBOOK TO GUIDEBOOKS: The informational interrelationship between written description, maps and diagrams as a means to easily reveal urban content continues to be the focus of my work.</u> The project is a critical analysis of certain classic guides and urban design presentations probing into workable, multiple paths of personal interest as a guide through the anxieties of learning about cities. Learning being defined as: <u>remembering what you are interested in.</u> This would be followed by the application of analysis to a selection of informational patterns in several cities. My working definition of a map is: <u>a pattern made understandable.</u> Understandability being related to a variable audience with different desires, needs and comprehensions. My goal is a guide that would allow with ease and with currency the development of the means to allow urban America to reveal itself, particularly in places where such publications have not been economically feasible. Investigations horizontally into the modes of laser video disc and simple floppy disc presentations would also be explored. Information in the 80's will be increasingly entertaining and designed using the appropriate technology.		8. Amount requested from National Endowment for the Arts: \$ 20,000 Allocated as follows: Time \$ 12,000 Material \$ 2,000 Travel \$ 6,000	
<p>10. Career summary or background. Complete in space provided. Resumes should be sent only as supplemental material.</p> <p>University of Pennsylvania 1953-59 B. Arch &amp; M. Arch Archaeological Expedition Tikal Guatemala 1958 Surveyor Office of Louis I. Kahn 1960-62 (London 1960) Project Director North Carolina Film Board 1962-64 Murphy Levy Wurman Architecture &amp; Urban Planning 1964-76 Funding Director GEE! Group for Environmental Education, Inc. 1968 Cambridge University School of Architecture Visiting Professor 1968 Board of Directors International Design Conference in Aspen 1970-80 Co-Chairman First Federal Design Assembly The Design Necessity 1973 National Chairman AIA Convention 1976 The Architecture of Information Deputy Director Office of Housing &amp; Community Development Philadelphia PA 1977 Dean and Full Professor, Calif. State Polytechnic Univ., Pomona California 1978 ACCESS PRESS Ltd. Founded in 1982 A/D (Technology, Entertainment, Design) 1984</p>			

**Grant Applications  
Process Research**

When a designer desires to secure funding for a project or anticipates applying for various grants there needs to be a structure to the communication that exists. This collaboration must encompass the ability to articulate the vision of your project. The following pages detail the critical structure that is needed to secure funding for an Exhibit and provides the designer with a greater sensibility for grant writing.

**Necessary Parts**

- Scope of Performance
- Time for Performance
- Qualitative Standards
- Acceptance and Approval
- Payment
- Ownership
- Subcontracting
- Warranty
- Copyright
- Default
- Optional Services
- Representation
- Price Warranty
- General Conditions



Grant Applications  
Process Research

The following pages are all documentation of the collaboration necessary to secure funding for the redesign and adaptation of Will Burtin's *Kalamazoo Story* exhibit. The information was useful to the designer in terms of analyzing the fundamentals of well written proposals. The proposals are detailed with project descriptions and effective budgets.

Grant work  
Will Burtin

AWARD NOTICE U. S. INFORMATION AGENCY		This number must appear on all PACKAGES and PAPERS relating to this notice.	
Point of Issue <b>8-9</b>	Authorization No. <b>Washington 25, D.C.</b>	Award No. <b>7381-8-58</b>	Date <b>December 20, 1957</b>
Appropriation Symbol and Title <b>6780100</b>	Contract No. <b>C-7690-01954-04954-05954</b>	For: <b>Will Burtin</b>	
Consignee and Destination <b>U. S. Information Agency</b>		Time for Delivery <b>January 24, 1957</b>	
Acquisition No. <b>40185/C-670</b>	F. O. B. Point <b>Destination</b>	Ship Via	Government B/L No.
ITEM NO.	ARTICLES OR SERVICES	QUANTITY	UNIT PRICE
	On the basis of recent negotiations and understandings reached, you are hereby authorized to proceed with the following work for the Agency:		
	Redesign and adapt for a photo-panel display, the exhibit entitled " <u>Kalamazoo</u> "		
1.	The display will consist of 36 panels approximately 30" x 40" each. Thirty-five panels are to be one-sided, the opening panel to be a dual purpose panel.		
2.	Photography and art work are to be screened, revised and suitably re-organized for the panel version.		
3.	Edit and re-write as may be necessary and prepare the text and caption in English. Modern face electric typewriter is to be used in preparing copy.		
TOTAL			\$1950.00
NOTICE TO VENDOR:  SEE REVERSE SIDE FOR DETAILED INSTRUCTIONS WHICH MUST BE CAREFULLY FOLLOWED		<b>A. J. Gross</b> Signature <b>A. J. Gross, Chief</b> Name <b>Information Center Contract Branch</b> Title <b>Contracting Officer</b>	
1. - VENDOR		U.S.G.P.O. 1967-618489	

Grant Applications  
Process Research

The designer found value in referencing Will Burtin's proposals for the purpose of learning how to articulate a conceptual orientation successfully.

UNITED STATES INFORMATION AGENCY  
WASHINGTON

November 7, 1957

Will Burtin

Attn: Mr. George Klauber

Gentlemen:

On the occasion of a visit to your offices last week the writer and Mr. Jack Masey of the Agency discussed with you a proposed plan under which you would undertake the redesign and adaptation of the Kalamazoo Story Exhibit.

The adaptation would be along the lines of a photo-panel display to be used in conjunction with an aluminum panel and modular structure which the Agency plans to separately develop.

As indicated to you the Agency will be pleased to consider a proposal from you setting forth in detail a description of the scope of your work and a cost breakdown.

As discussed the major areas of work are as follows:

1. The display will consist of thirty-six (36) panels, approximately 30" x 40" each. Thirty-Five (35) panels are to be one-sided, the opening panel to be a dual-purpose panel.
2. Photography and art work of the original exhibit are to be screened, revised and suitably re-organized for the panel version.
3. Edit, re-write as may be necessary and prepare text and caption in English. Modern face electric typewriter is to be used in preparing copy.
4. Furnish complete revised layout in quarter size scale (7½" x 10" illustration board panels) with paste-ups showing location and size of photography and copy, positive photostats and color specifications.
5. The final design to include all necessary negatives, glossies, color swatches and copy for production.

Kindly submit your proposal at your earliest convenience.

Very truly yours,

A. J. Gross

A. J. Gross

Chief, Information Center Contract Branch  
Contracting Officer

Grant Applications  
Process Research

Mr. A. J. Gross  
Chief, Information Center Contract Branch  
Contracting Officer  
U. S. Information Agency  
Washington 25, D. C.

November 18, 1957

Dear Mr. Gross:

In accordance with your letter of November 7, I have gone over the production cost of the re-design and adaptation of the Kelamascos exhibit. I concluded from your breakdown of work to be performed what the cost factors are, which I am listing in this proposal:

- |   |            |
|---|------------|
| 1. A full script, based on the editorial material assembled for the exhibit in England, but revised on the basis of the continuous panel system | \$450.00 ✓ |
| 2. Design, paste-ups, typing of copy as specified, etc.   | 880.00     |
| 3. Detailing for reproduction, lettering of title, retouching of photographs, art work, etc.  | 325.00     |
| 4. Material expenses, such as photostats, boards, colors, other art materials, etc.   | 470.00     |
| Total Cost .....  | \$2,125.00 |

Thanking you for your inquiry, I remain

Sincerely yours,

Will Burtin

c.c.: Mr. Jack Masey



Grant Applications  
Process Research

This letter is an example of the intermediate collaboration that was necessary to secure funding. Here Will Burtin is addressing various difficulties and disadvantages, which have increased his expenses. The designer gains valuable insight concerning the importance of accurately communicating additional expenses.

Miss Jacqueline Griffith  
Exhibits Officer  
United States Information Agency  
Washington, D.C.

August 13, 1958

Dear Miss Griffith:

As I indicated to you and Mr. Massey earlier, I had the impression that my expenses for labor and script writing, identified in our various cost estimates on the Berlin "Kalamazoo" exhibition as fees, run considerably higher than could be estimated.

To begin with, one is always at an initial disadvantage when estimating an assignment before the first pencil strokes have been put on paper, or the basic research steps have been taken. A realistic cost picture can develop only after these design and research steps have been taken. I suppose some of these difficulties are unavoidable in government budgeting procedures.

In addition to my basic disadvantage, there have been increases in my expenditures, caused by two factors:

- 1) The condensing of all work on the exhibit, involving steps 1 - 6 of my original estimate, to eight weeks for all design detailing, research, writing, photography, specifications etc., meant taking shortcuts, by putting more people on the job than estimated.
- 2) The official Labor Department section whose existence, or reason for existence- developed only after our first research trip to Berlin, and prior to the second, constitutes a clear addition to the first exhibit concept on which the contract was based. This department, located on the upper floor of the Marshall House, is entirely outside of the labor story as it was planned, and is told in the sequences on Sutherland and Gibson labor-management relations. This was emphasized in our various meetings with Mr. Bazan of the Labor Department in the following way:  
The Labor Department story is a national and not a Kalamazoo story. While a tangential relationship may be developed in some way, in this department it should be done only for the purpose of having the Labor Department story not entirely disconnected from the Kalamazoo exhibit.

Grant Applications  
Process Research

Miss Griffith (page 2)

My additional expenses for the Labor Department Section can at this time be accurately stated:

a) Additional cost of writing	600.00
b) Additional cost of design	500.00
c) Additional cost of detailing for construction specifications, etc.	650.00
d) Photography	150.00
e) Overhead charges	270.00
	<hr/>

TOTAL.....\$2,470.00

In addition to the above, listed under No. 1, the condensing of work entailed higher expenses for research, photographic supervision, and labor cost at my office. According to the time records, this additional amount is now close to \$2,400.00 and I want to see to it that it does not exceed that figure.

I thought it advisable to inform you of these items so that ways and means can be investigated now to recover these expenses by amending the original contract. In comparing the actual amounts of reimbursable as against the estimated cost, I find that the former will be about \$2,000 below the latter. Perhaps here is a possibility to shift the classification from "reimbursable" to "fees", which would at least bring a reduction of the total amount that we are running over at present. Inasmuch as the expenditures constitute - with one exception - a direct money outlay on my part, I should think that a way can be found to prevent my personally financing a part of the U.S.I.A. exhibit.

Sincerely yours,

Will Burtin

**Grant Applications  
Process Research**

The following letter is an example of effective communication between Will Burtin and the United States Information Agency. The letter is asking for a breach of contract due to an unexpected volume of work. The designer evaluates effective collaboration where the designer is securing funding for two major exhibits and effectively breaching contracts in order to secure more time for implementation as he does transitions to the next job.

Mr. A. J. Gross, Chief,  
Information Center Service Contract Branch  
United States Information Agency  
Washington 25, D. C.

August 15, 1958

Dear Mr. Gross:

Due to the enormous pressure and unexpected volume of work which developed in connection with the Kalamazoo exhibition for the Berlin Fair, I have been forced to postpone further work on the design of the exhibition, "Plan for Peace" until the Berlin exhibit is completed.

I must therefore ask for authorization to delay the delivery of the design and the steps outlined in the original contract of the "Plan for Peace" exhibit until October 15, 1958.

Please be assured that I regret this delay very much, but I hope you realize that I have been forced into this position by circumstances beyond my control.

Sincerely yours,

Will Burtin



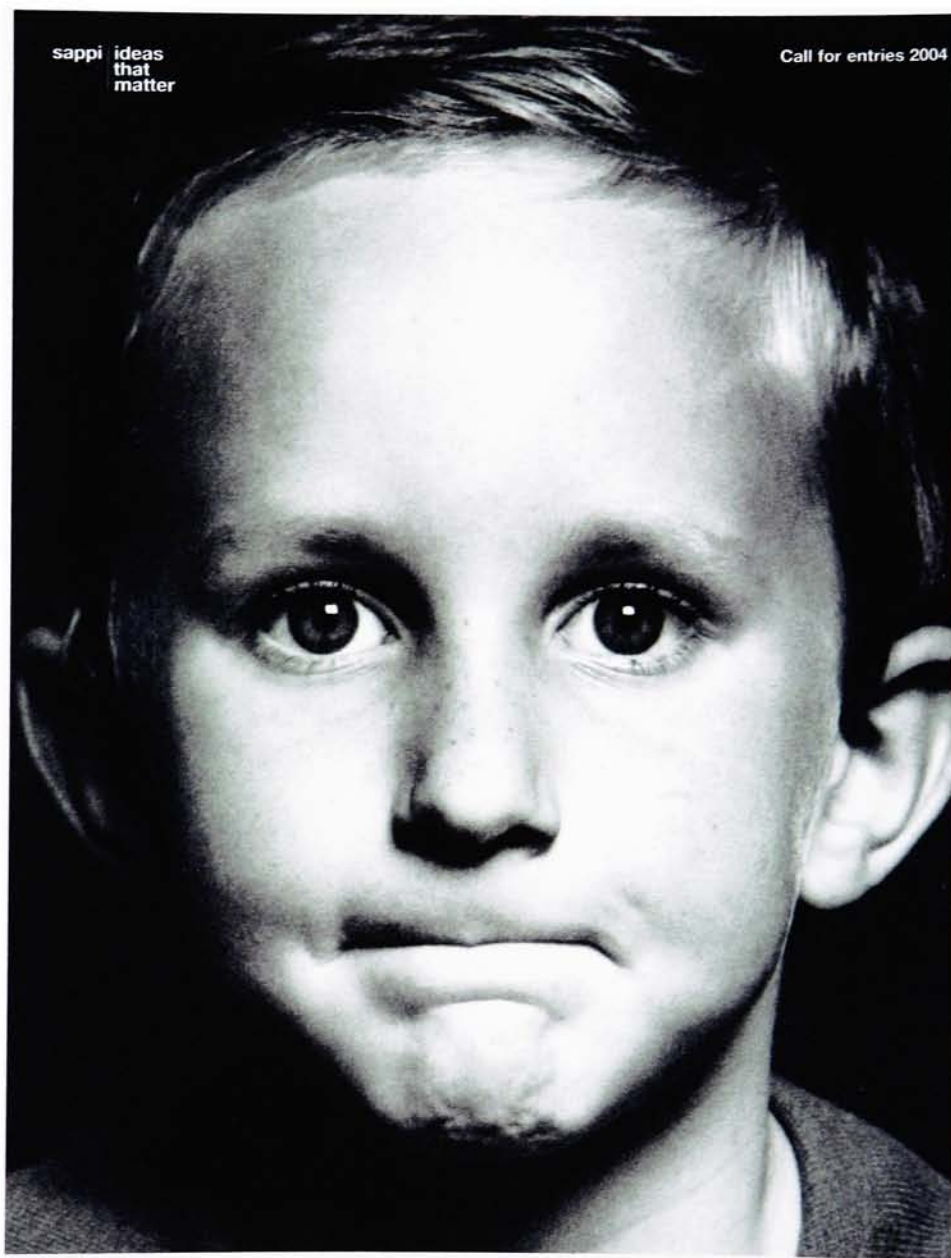
Grant Applications  
Process Research

This letter is an award notice from the United States Information Agency  
for Will Burtin's *Plan for Peace* Exhibit.

AWARD NOTICE U. S. INFORMATION AGENCY		This number must appear on all PACKAGES and PAPERS relating to this notice.		
S-9		Award No. <u>7774-1-58</u>		
Point of Issue <u>Washington 25, D. C.</u>		Date <u>March 24, 1958</u>		
Authorization No.	Appropriation Symbol and Title <u>6780100</u>			
Lotment and Object Class. <u>-7690-01952-02952-03952-04952</u>	For:			
Consignee and Destination S H U. S. Information Agency Exhibits Division - Att: Mr. J. Masey Washington 25, D. C.		T O		
Contract No. <u>IA-4811</u>	Time for Delivery <u>See Contract</u>	Terms <u>Net</u>		
Acquisition No. <u>42423/C-1014</u>	F. O. B. Point <u>Destination</u>	Ship Via	Government B/L No.	
ITEM NO.	ARTICLES OR SERVICES	QUANTITY	UNIT PRICE	AMOUNT
	Analytical research, design research preliminary design and development of treatment and preliminary script of a three-dimensional, medium size exhibit tentatively entitled "Plan for Peace" in accordance with the terms and conditions of the cited contract.	1	job	7020.00
Project D-786				NOT TO EXCEED
ICG/CC:AJG:jrr				NOT TO EXCEED
NOTICE TO VENDOR:				TOTAL \$7020.00
SEE REVERSE SIDE FOR DETAILED INSTRUCTIONS WHICH MUST BE CAREFULLY FOLLOWED				A. J. Gross
				Signature
				A. J. Gross, Chief
				Name
				Information Center Contract Branch
				Title
				Contracting Officer
1. - VENDOR				☆ G.P.O. 1957-418499

**Grant Applications  
Process Research**

*Ideas that matter* was established by Sappi Paper Company to recognize, encourage and help fund the wide variety of programs for the social good to which committed designers already lend their talents and skills pro-bono. These include support of organizations working toward progress in science, the environment, education, health and social conditions. The designer will apply for the Sappi Paper grant after graduation. The grant awards up to fifty thousand dollars to implement an exhibit.



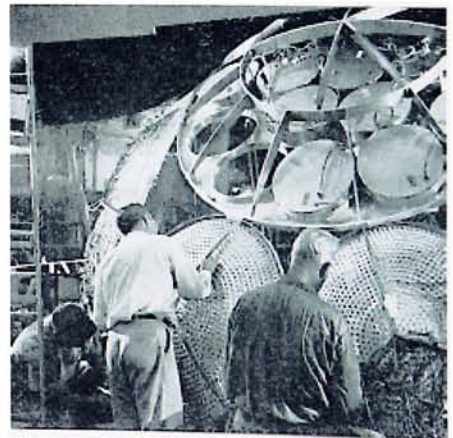
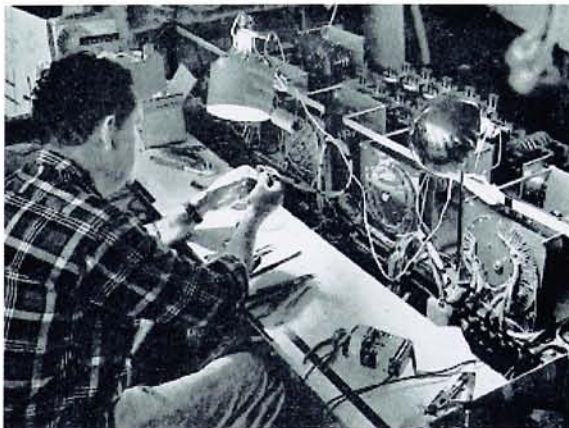
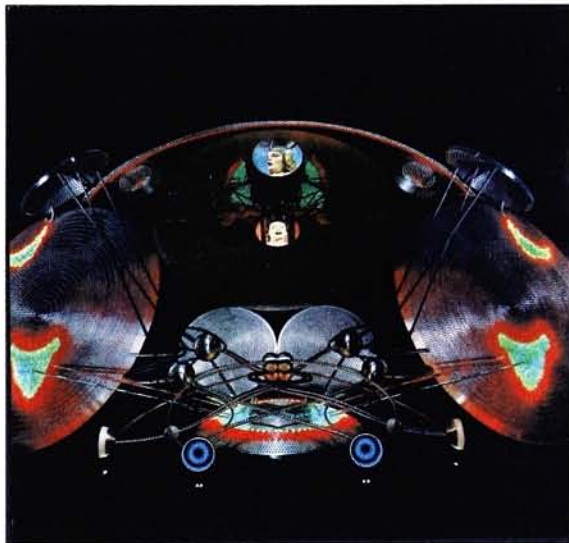


## Case Study 1

Will Burtin, *The Upjohn Brain Exhibit*, 1960.

The brain exhibit was a successful attempt to foster increased understanding with various aspects of the brain such as the nature of imagination, pattern recognition, control mechanisms, information retrieval, and many others.

The exhibit contained thousands of lights that would indicate and trace thoughts. The model contained various images, colors, and sequences of thought and recognition patterns.



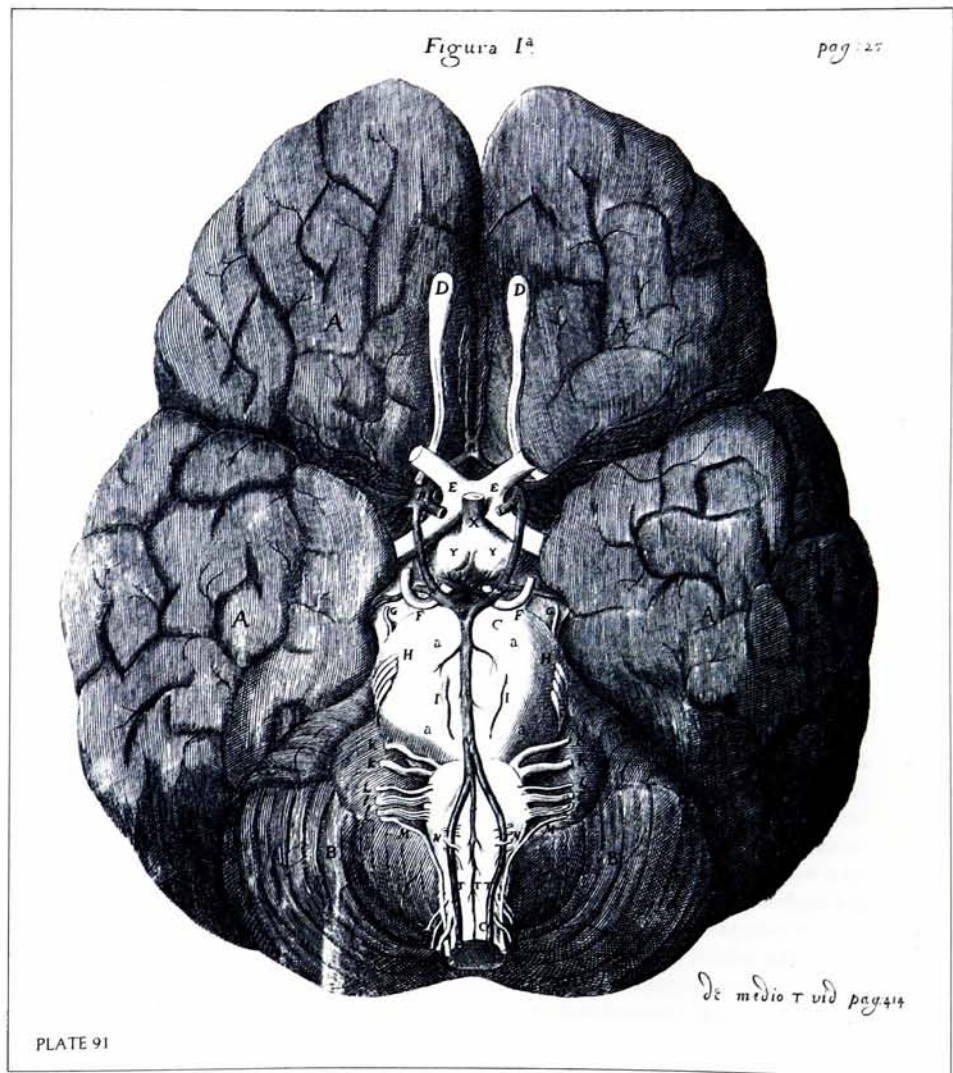


## Case Study 1

Christopher Wren  
*The Base of the Brain*, 1664

This anatomical illustration designed by Christopher Wren, a multi-disciplinary designer. Wren designed numerous well respected architectural structures, including St. Paul's Cathedral in London.

Wren worked in collaboration with Thomas Willis who is associated with the discovery of the anastomosis at the base of the brain. Christopher Wren worked closely with Thomas Willis and often participated in dissections. This reciprocal collaboration provoked Wren to reason about the brain's uses and parts, which helped him in communicating the parts.



## Appendix

Jan van Riemsdyk,  
Obstetrical forceps, 1754

A detail of Jan van Riemsdyk's *Obstetrical Forceps*, 1754




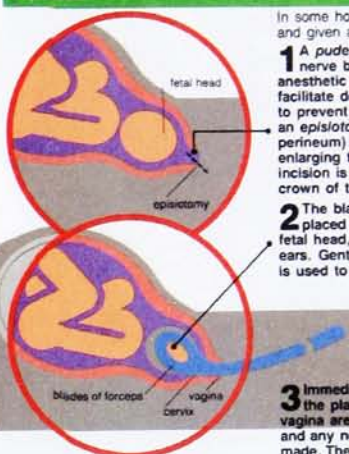


## Appendix C

## Appendix

Richard Saul Wurman,  
Medical Access Book, 1985

A detail of Richard Saul Wurman's, *Medical Access Book*, Forceps delivery, 1985

FORCEPS DELIVERY		LOW FORCEPS DELIVERY WITH EPISTOMY	622,000 Frequency in 1982	5 min Duration of Operation	recovery room 1-2 hrs	walk 1st postop day	
<b>Nature of problem.</b> When labor fails to progress normally and the baby seems stuck, your obstetrician may consider assisting and hastening delivery with an episiotomy (enlarging the vaginal opening by making an incision in the perineum) and use of forceps. This approach to delivery may be considered in the presence of 1 or more of the following conditions: <b>Baby's head delayed</b> on the perineum for more than 30 minutes or <b>second stage of labor exceeding</b> 1 1/2 hours, <b>fetal distress</b> (abnormal fetal heartbeat), <b>breech presentation</b> where the baby is backwards and will be born head last, <b>maternal distress</b> or <b>preexisting medical problem</b> such as heart disease. The procedure may also be advisable in premature births where the infant's head is unable to withstand the pressure of prolonged contractions.	<b>Surgical preparation.</b> If you have been seeing an obstetrician regularly, you have probably already had a variety of tests including: <b>Complete blood count</b> and <b>Urinalysis</b> , as well as pelvic measurements and perhaps <b>Fetal ultrasound</b> or <b>Fetal monitoring</b> . Your blood should also have been typed and cross matched in the unlikely case that a transfusion is needed. During labor, a number of diagnostic observations are made and recorded: the position of the baby's head is determined, his or her heart rate is measured by a fetal monitor and the cervix is observed for dilation. In some hospitals, you are given an enema and your pubic hair is shaved. In preparation for delivery, your thighs and vulva (external opening of the vagina) will be cleansed with antiseptic, with additional antiseptic poured on the vagina.	<b>Procedure.</b> 		<b>Stages of recovery.</b> You will be taken to the obstetrical recovery room for an hour or less. On the first day after delivery you will be encouraged to walk. <b>Limitations.</b> Your doctor will instruct you to avoid all heavy lifting and strenuous exercise, as well as intercourse, for 6 weeks. You may be given a small cushion or donut to make sitting more comfortable while the episiotomy heals. <b>Drugs.</b> You may receive medication for relief of postpartum pain. <b>Complications.</b> Breast swelling and pain due to milk congestion may occur after delivery. If you are nursing you will be given hot packs to stimulate milk flow. You may also be encouraged to nurse more frequently. If <b>phlebitis</b> (inflammation of a leg vein) occurs, you may receive a blood thinning drug. Your foot will be kept elevated and heat will be administered to the affected leg. <b>Scar.</b> There may be a small scar which may be initially uncomfortable when intercourse is resumed.			
Nearly one-third of female infertility cases involve the fallopian tubes. The tubes may be blocked, scarred or missing. Infertility has nearly tripled among women aged 20-24 years since 1965. Every year in the United States, an estimated 8,000 babies are born to women inseminated with donated sperm.		<b>Anesthesia.</b> You will receive a pudendal block (regional nerve block) or an epidural block.					

Visual Inspiration

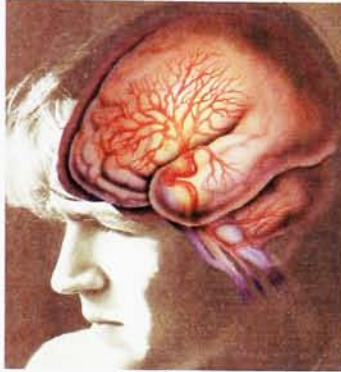


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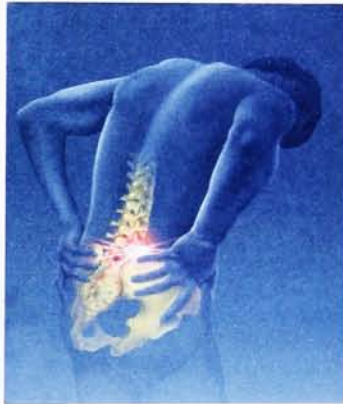
**Visual Inspiration**

These are visual examples the designer critically evaluated to better conceptualize an effective solution for the final application. These illustrations were useful to the designer as examples that effectively emphasize the problem area in proximity to the rest of the body. This particular aspect is of importance to the designer because it makes it easier to comprehend the entire scope of the problem.

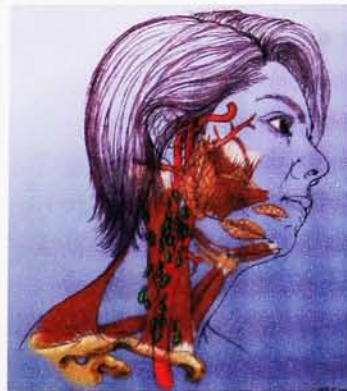
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**Jackie Heda**

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**Ann Arbor**

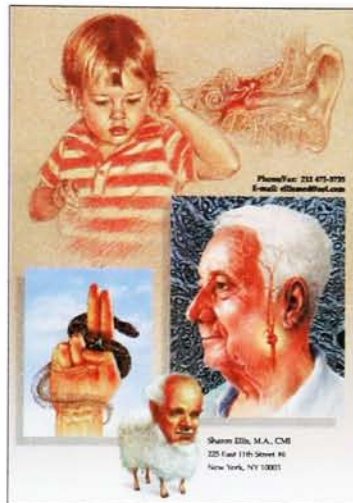
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**Lori A. Messenger**

**Visual Inspiration**

Medical illustrator Sheron Ellis's poster is a strong example of a medical illustration that also illustrates the reaction of a medical problem. This may be a good precedent for the designer to reflect on in terms of communicating the outcome of a particular neurological problem which elicits a tic.

Robert Margulies is an illustrator who specializes in anatomical and surgical illustration. The designer collaborated with Robert Margulies to communicate the neurology of Gilles de la Tourette Syndrome in the final application.

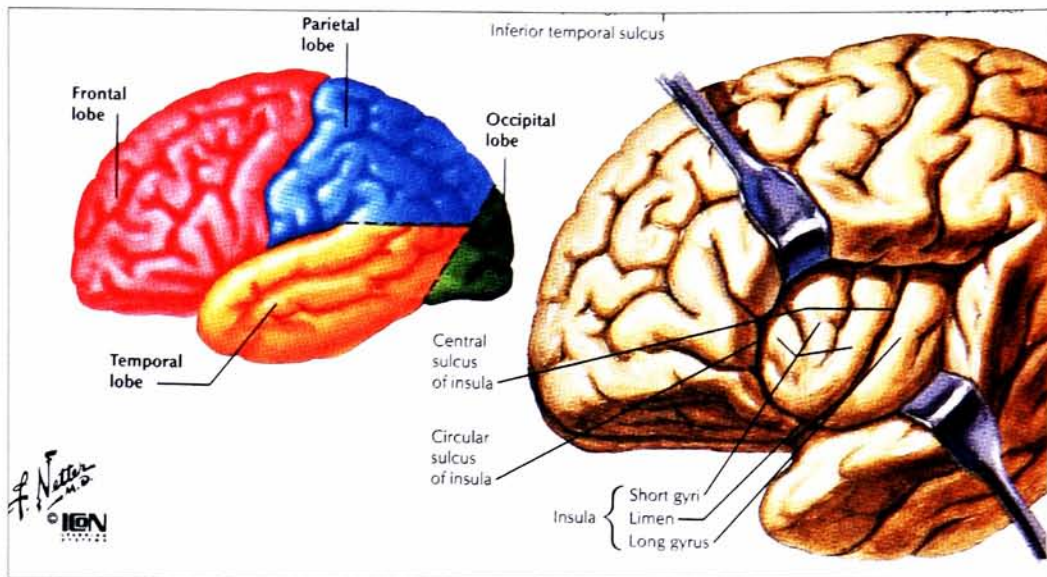
**Sheron Ellis****Robert Margulies**

Medical Information

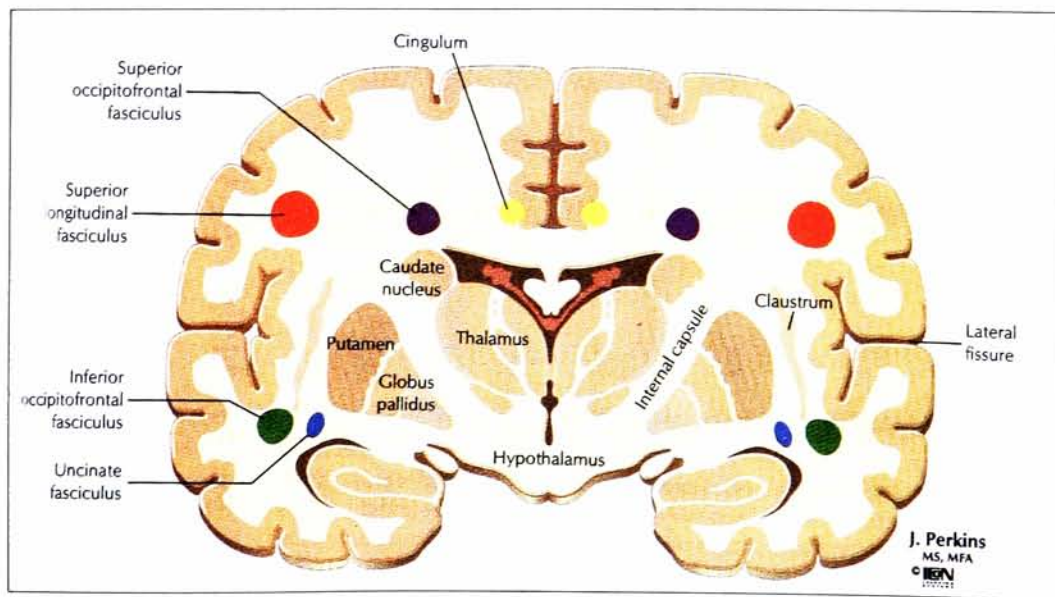
## Medical Information

All of the examples in Appendix E are representative of numerous medical illustrations the designer referenced during research. This allowed the designer to properly synthesize new current research concerning the neurological chemical imbalance associated with Tourette Syndrome.

Frank H. Netter



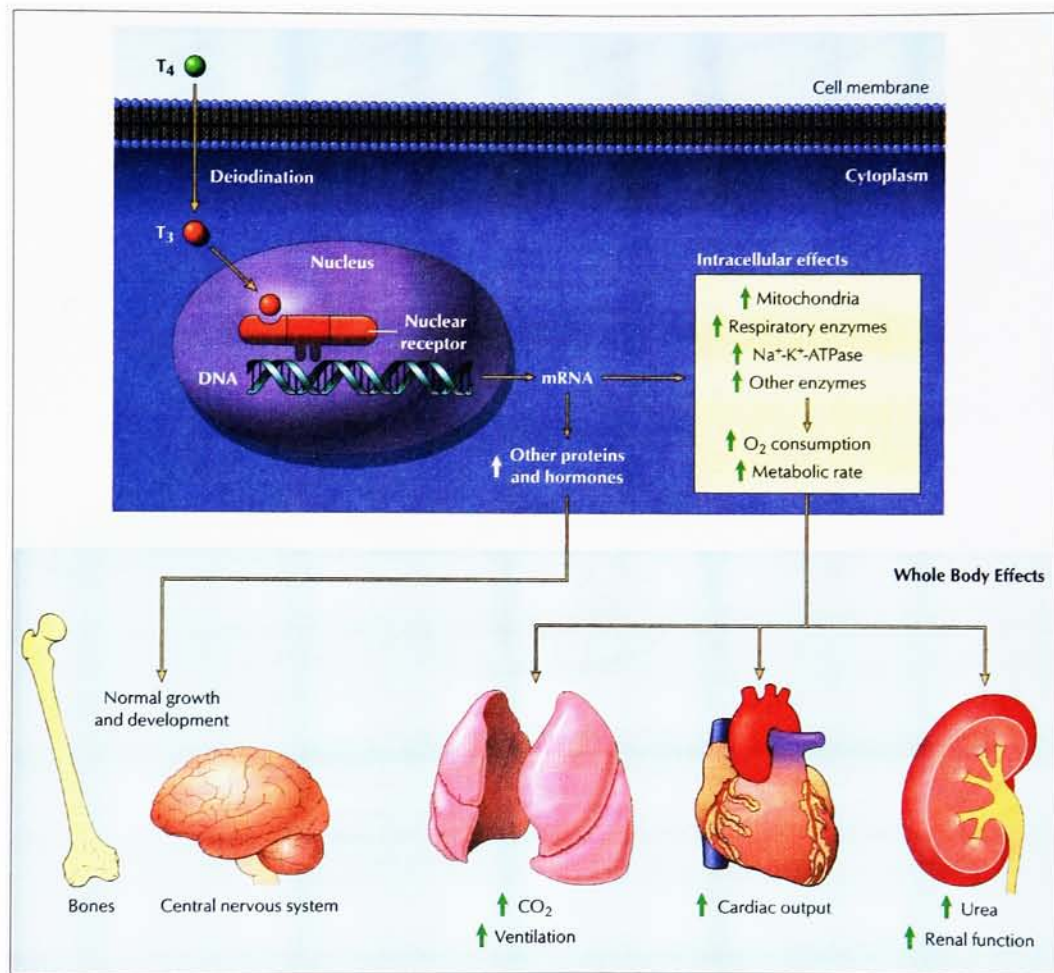
James A. Perkins





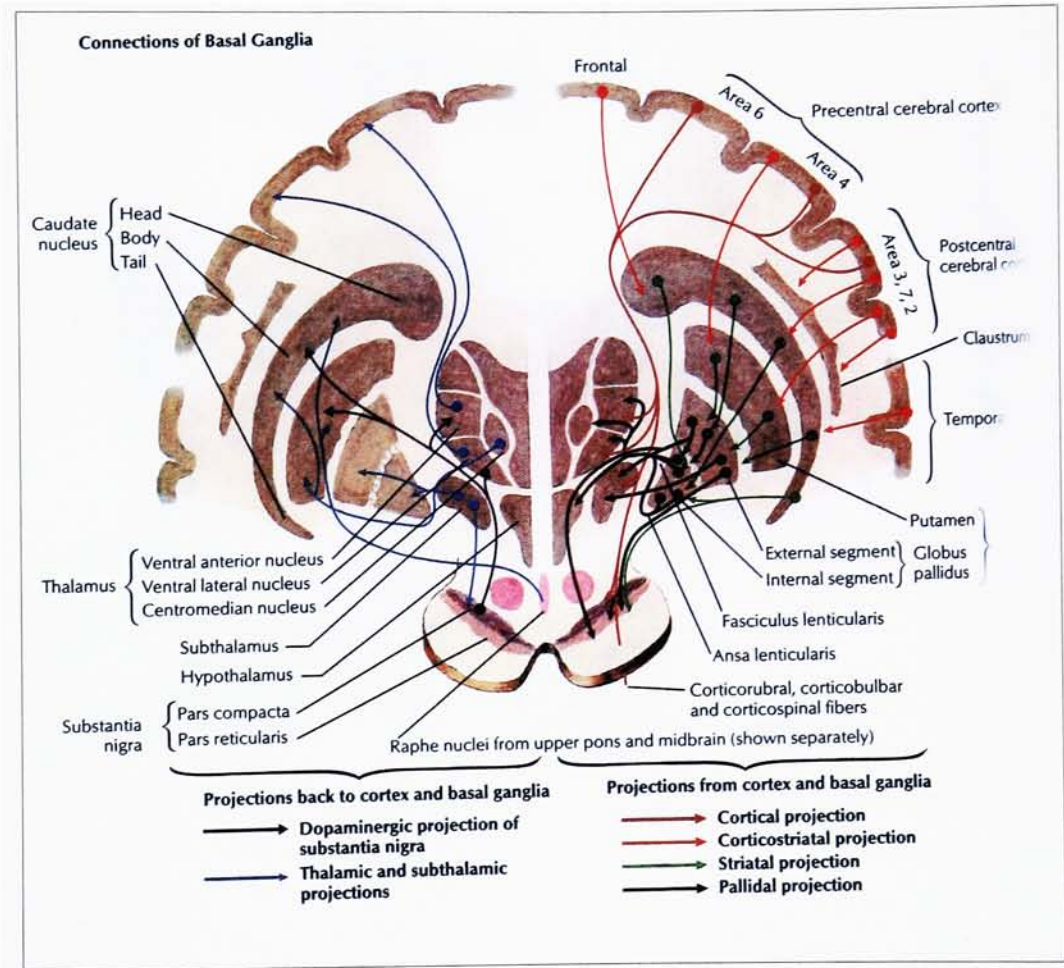
## Medical Information

James A. Perkins  
continued



## Medical Information

Frank H. Netter



## Medical Information

## Icon Learning Systems

