Elkin R. Isaac
Research Symposium

Honoring Outstanding Student Research 1998

Supported by:
Elkin R. Isaac Endowed Lectureship, Honors Program,
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The Elkin R. Isaac Endowment

The Elkin R. Isaac Endowed Lectureship was created in 1991 by Albion College alumni in honor of their former teacher, coach and mentor, Elkin R. " Ike" Isaac, '48. Isaac taught at Albion from 1952 to 1975 and coached basketball, track and cross country. He led his teams to one Michigan Intercollegiate Athletic Association basketball title, six consecutive league championships in track, and three cross country championships. He also served as the College's athletic director and created Albion's "Earn, Learn and Play" program and the "Albion Adventure Program." In 1975, Isaac became athletic director at University of the Pacific and retired there in 1984. He now lives in Kalamazoo, Mich., with his wife Edith.

Reflecting Elkin Isaac's lifelong interests in higher education and research, proceeds from the endowment are used to bring a noted scholar to campus each year to offer the Isaac Lecture and to visit with classes. In 1997, the Isaac Lectureship was expanded and is now associated with Albion College's annual Student Research Symposium, featuring presentations by students recommended by their faculty sponsors for outstanding independent study and research. The symposium now bears Isaac's name.

The Isaac Endowment Committee
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The Ninth Annual
Elkin R. Isaac Student Research Symposium
Albion College
April 13-15, 1998
Schedule of Events

Monday, April 13, 1997
Noon
Dedication of Sculpture, “Faith of Odysseus,” by Terrence Karpowicz, ’70
Entrance to Albion College A-Field

7:30 p.m.
The Elkin R. Isaac Student Research Symposium
Opening Remarks: Thomas G. Schwaderer, M.D., ’56
Elkin R. Isaac, ’48
The 1998 Elkin R. Isaac Lecture: Terrence Karpowicz, ’70
Introduction: Frank J. Machek, Department of Visual Arts
Babbit Visual Arts Center Auditorium

Tuesday, April 14, 1998
3:00-5:10 p.m.
Student Research Symposium Platform Presentations
Welcome and Introductions: Jeffrey C. Carrier, Vice President for Academic Affairs
Olin Hall 112

5:15-5:45 p.m.
Poster Sessions
First Floor, Kellogg Center

7:00-9:00 p.m.
Student Research Symposium Platform Presentations
Olin Hall 112

Wednesday, April 15, 1998
3:00-5:15 p.m.
Student Research Symposium Platform Presentations
Olin Hall 112

5:15-5:45 p.m.
Poster Sessions
First Floor, Kellogg Center

7:00-9:00 p.m.
Student Research Symposium Platform Presentations
Olin Hall 112
Schedule of Presentations
All platform presentations are in Olin Hall 112.

TUESDAY, APRIL 14, 1998
3:00 - 5:10 p.m.  Student Research Symposium Platform Presentations

3:10  Heather Gavord  The Effect of Gender on Perceptions of Candidates in a Resume Evaluation Session

3:25  Katie Drake  The Influence of Managed Care, Specifically HMOs, on the Ability of Physicians to Provide Quality Preventive Care

3:40  Tamron Gouver  Our Justice and Jury System: Factors Affecting the Public’s Perception of Fairness

3:55  Daniel Haar  Rauty and Nussbaum: The Idea of the Self

4:10  Molly McCracken  The “Eyes” Have It: Vision in the Novels of Laura Esquivel

4:25  Michael Jones  Taxonomic Placement of Henrietta squamulosa (Melastomataceae: Micranthe) based on ITS Ribosomal DNA Sequences

4:40  Laura Johnson  The Role of Ha-Ras in Mast Cell Granule Morphology and Intracellular Movement

4:55  Emily Marlowe  Children’s Facework in Social Predicaments

5:15 - 5:45 p.m.  Poster Sessions, First Floor, Kellogg Center

Arthur Bragg  Construction and Characterization of a Molecular Beam Apparatus

Angela Doty  The Effects of Psychological Stress on the Immunoglobulin-A Levels in Albion College Students

Pamela Haywood  Archaeological Geology of the Duck Lake Site

Teddi Krabach  Gaussian Quadrature in Two Dimensions

Mary Lemcke  GIS Analysis of Vertebrate Diversity with Respect to Climate

Ryan McKeachie  A New Photochemical Method for the Production of Polypyrrole

Kelly Probert  Physical Education Leads to Life Patterns of Physical Activity

Wendy Van Soyoc  Ortholithiation of Prenylide and Subsequent Alkylation with Carbonyl Compounds: A Preliminary Investigation

7:00 - 9:00 p.m.  Student Research Symposium Platform Presentations

7:00  Michael Callahan  The Influence of Expectancy, Recency, and Frequency on the Major/Minor Distinction

7:15  Joseph Ales  The Use of the Hobo Transposable Element to Study DNA Repair in the Fruit Fly Drosophila melanogaster

1998 Isaac Student Research Symposium
7:30 Loretta Rozdoloske  People's Perceptions of the Battered Woman and Her Batterer
7:45 Thomas O'Brien  "Progress is Abortion's Future": A History of the West Central Urban Renewal Project
8:00 Scott Johnson  Strength and Conditioning Program for Swimmers
8:15 Jaime Petrus  Investigation of the Photoreduction of Carbon Tetrachloride by Titanium Dioxide Using GO/MS with Headspace Sampler
8:30 Jennifer Harduc  The Effects of Exposure to Made-for-TV Films on Perceptions of Victims of Violence
8:45 Jennifer Jacobs  Microbial Removal of Chloroorganics from Dilute Gaseous Waste Streams

WEDNESDAY, APRIL 15, 1998
3:00-3:15 p.m. Student Research Symposium Platform Presentations
3:00 Stephen Lathum  Reconceptualizing the Ghetto
3:15 Shawn LaCasse  Acquisition of MS/MS Reference Data of Industrial Chemicals by Ion Trap Mass Spectrometry
3:30 Audrey Adams  ¿Quién es Eva Perón? Who is Eva Peron?
3:45 Jennifer Hanket  Patient Characteristics and Patient Satisfaction: A Two-Part Study
4:00 Kathryn Cavanaugh  The Women of Dean Hall
4:15 Heather Bullen  Do Aromatic Methoxy Groups Lead to Cross-Linking in the Thermolysis of Low-Rank Coal?
4:30 Amanda Gilman  Properties of a Thermophilic Cellulase from Thermotoga maritima
4:45 Timothy Minnihan  The Effects of Larval Xenopus laevis Xenografts on Spinal Cord Crush Injuries in Anubias labriformis
5:00 Anne Bruce  The Persistence of the False Memory Effect

5:15-5:45 p.m. Poster Sessions, First Floor, Kellogg Center
See Tuesday schedule.
7:00-7:15 p.m. Student Research Symposium Platform Presentations
7:00 Robert Jageman  Dreiske and the Challenge of Misrepresentation
7:15 Melora Haas  A Comparison of the Retention of Year-Old Fruit in Two Species of Sumac, Rhus typhina and Rhus glabra
7:30 Jennifer Ralston  The Catholic Church and the Third Reich During the Pre-War Years, 1926-1939
7:45 Phillip Shaltis  Design, Construction and Programming of an Autonomous Mobile Robot
8:00 Cara Sodiak  Economic Considerations Bar Equal Access to the Civil Justice System
8:15 Else Georgi  An Analysis of Thomas Mann’s Novella, Mario and the Magician
8:30 Amanda Carriere  Nazi Persecution of the Roma People: "Our ashes were mingled in the river"
8:45 Elizabeth Kudirka  The Word as Power in the Works of Isabel Allende

1998 Isaac Student Research Symposium
"Millwright’s Apprentice"

Terrence Karpowicz, ’70

Terrence Karpowicz is a professional sculptor who lives and works in Chicago, Ill. He has received two National Endowment for the Arts fellowships and five grants from the Illinois Arts Council in support of his work. He also received a Fulbright Hayes Grant to the United Kingdom. Karpowicz’s work is now held in collections in the Tbilisi Museum in the Republic of Georgia, the Stenersland Museum of Art and Tweed Museum, both in Minnesota, and the Rockford Art Museum in Illinois, as well as at the University of Oklahoma at Norman, Governor’s State Park, Park Forest, Ill., and Tiffany’s & Co. His works have been commissioned by Northeastern University in Chicago, Crain’s Chicago Business, the University of Illinois Medical Center in Chicago, the City of Chicago’s Thurgood Marshall Memorial Library and the Illinois State University Life Science Building in Normal, Ill.

For the past three years, he has been executive director of the 3D Chicago/Pier Walk Exhibition at Navy Pier and has also participated as an exhibitor.

His solo exhibitions have been displayed at the Franz Bader Gallery in Washington, D.C., the Zolla/Lieberman Gallery in Chicago and at other locations in the Midwest, and he has been a featured artist in group exhibitions at McCormick Gallery, DePaul University, the Ukrainian Art Museum, and the Evanston Art Center, all in the Greater Chicago area, as well as at University of Notre Dame, Carnegie Mellon University and Albion College.

A 1970 graduate of Albion College, Karpowicz also participated in the New York Arts Program while at Albion. The recipient of an M.F.A. degree from the University of Illinois at Champaign-Urbana, he has served as a visiting artist at nine colleges and universities. Recently he has been commissioned to create two sculptures for Albion College, and the first, now installed near the entrance to the Dow Recreation and Wellness Center, was dedicated today (April 13, 1998).
Adams, Audrey, '98

¿Quien es Eva Peron? M ̃[a ̃ra? Spanish and Political Science
Faculty Sponsor: Pamelia Muhlb

Eva Morris Duarte de Peron was the second wife of former Argentine President Juan Domingo Peron and is often referred to as the most powerful woman in the history of Argentina. Born into poverty, Eva aspired to be an actress and so moved to Buenos Aires at the age of fifteen to fulfill her dream. There, she met Colonel Juan Peron whom she soon married. When Colonel Peron was elected president in 1945, Eva immediately became a very prominent first lady. Her participation in the government helped to maintain Peron's popularity throughout his two terms in office, even after her death.

My project attempts to re-evaluate the many roles Eva assumed: first lady, a champion of the working class, a leader of the Women’s movement. Even after her death, her legacy was considered larger than life. Eva Peron evokes strong feelings of both love and hatred among both her supporters and opposition. However, it can be argued that she has had a lasting impact on Argentina, as well as the world, as both her personality in addition to her actions are studied today. Over forty years after her death, scholars are still left posing the question, ¿Quien es Eva Peron? By analyzing her own writings as well as other biographical and critical materials, I am attempting to clarify the answer to this question.

Bragg, Arthur, '99

Construction and Characterization of a Molecular Beam Apparatus
Facility Sponsor: Craig Bier

In order to simplify molecular electronic emission spectra, we have undertaken the task of designing and constructing a molecular beams/laser-induced fluorescence spectrometer. The design consists of a home-made pulsed nozzle placed inside a high vacuum chamber. The molecular beam is produced by the supersonic jet expansion of a gas sample into the vacuum chamber through a 500-micron pinhole. The pulsed nozzle, constructed from the element of a piezo-driven audio speaker, is driven by a 200 V, 30 ns square wave at 30 Hz. The characteristics of the molecular beam produced by this method, such as pulse width and degree of cooling, can be probed with laser-induced fluorescence spectroscopy.

Ales, Joseph, '98

The Use of the hobo Transposable Element to Study DNA Repair in the Fruit Fly Drosophila melanogaster
Major: Biology
Faculty Sponsor: Ivan Saret

The hobo element is a transposable element found in the fruit fly Drosophila melanogaster. Transposable elements are pieces of DNA that can “jump” from one chromosomal location to another. When transposable elements jump out of a chromosome, the chromosome is temporarily broken into two pieces.

The genes encoded to repair this and other types of chromosomal damage are called DNA repair genes. Cells with defective DNA repair genes accumulate mutations, which can lead to drastic consequences for the cell, including cell death, or the development into a cancer cell.

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Three groups of participants were involved in an experiment to test the hypothesis that people will remember words related to words that they heard even though the words they remember were never actually presented and that they will remember fewer words after a delay between hearing the words and a recognition test.

In the present experiment, people heard 12 words related to the word "sleep," but never the word itself. They were then given a printed 30-word list containing 12 sleep-related words, the word "sleep" itself and 17 words not related to the concept sleep. They rated each of the words on a 5-scale, with 1 indicating no, the word definitely did not appear on the first list, through a zero-point of uncertainty to 5, the word definitely appeared on the list the first time. After delays of 1 hour, 6 hours, or 24 hours, people again did the recognition test using the same judgments about the words on the printed list.

An analysis of variance indicated that people differentially recognized sleep- vs. non-sleep-related words as well as the word "sleep." F(2,72)=598.97, p<.0001. There was, however, no significant difference among word recognition over the three delay conditions, F(2,72)=2.33, p=.130. A possible reason for the finding of no delay effect is that the task was perhaps so simple as to allow a ceiling effect to occur. The false memory for the word "sleep" was robust, however, and lasted over the delay periods with a reported confidence rating greater than that seen for any of the other words, again, even though it was never presented.
Callahan, Michael, ’95
The Influence of Expectancy, Recency, and Frequency on the Major/Minor Distinction
Major: Cognition, Social and Psychological
Faculty Sponsor: William Hayes

The present study was a modification of a study by Epstein and Roek (1960) that attempted to show that expectancy can be explained in terms of recency and frequency. They carried out four experiments to tease out the differences in visual experience due to expectancy, recency, and frequency. This study utilized major and minor triads, and chords that were ambiguously major and minor, so that the same questions could be asked for audition. It was found that the quality of the expected chord, major or minor, had a significant effect on the response. Expectations had a significant effect on perceptions. In addition, musical experts tended to be more consistent in their responses.

Carriere, Amélie, ’98
Nazi Persecution of the Roma People: “Our ashes were mingled in the oven.”
Major: International Studies
Faculty Sponsor: Geoff Cooke

The Roma, also known as the Gypsies, have endured a long history of persecution and discrimination in Europe. Like the Jews, the Roma have been used as a scapegoat in times of economic or political strife. During the Third Reich, the Nazis categorized the Roma as an social and criminal race that they had to destroy in order to preserve German culture and society.

Many scholars and historians believe that the annihilation of the Roma by the Nazis was not a case of genocide, but rather was a travesty of justice against a group of people that the Nazis felt were socially dangerous, due to deviant behavior. Historians estimate that over one million Roma died during the Nazi regime, yet in many books and articles on the Holocaust they are a mere footnote.

Until recently, very few scholars researched or wrote about the Povazian, which is the Romani word for the Holocaust of the Gypsies. I looked at a number of sources, both written about the Roma, as well as more comprehensive Holocaust books. I concluded that the Roma were the only other ethnic group, besides the Jews, slated for extermination for racial reasons by the Nazis. Unlike the Jews, however, most Romans did not receive compensation, nor are they given much recognition at Holocaust memorials.

Today the Roma still do not enjoy full equality with other minorities in Europe, especially in the former Communist bloc countries, such as Romania and the Czech Republic. I believe that only by educating people about the history and true nature of the Roma will people learn to accept Romani as an important and necessary ethnicity in Europe and North America.

Cavanaugh, Kathryn, ’98
The Women of Dean Hall
Major: Anthropology/Sociology and English
Faculty Sponsor: Molly Mulkin

My project, "The Women of Dean Hall," is an ethnographic study of the women who have lived at Dean Hall from its founding in 1928 to the present. My purpose was to explore the relationships between the women, the trends that have existed in the house, how Dean Hall reflected the happenings of the greater society, and what it was and is about Dean Hall and its women that created the family-like community that exists there. I was also very interested in the feminist aspect of the recent Dean Hall and whether or not feminism has always been a part of Dean.

1998 Isaac Student Research Symposium
Doty, Angela, '95

The Effects of Psychological Stress on the Immunoglobulin-A Levels in Albion College Students

Major: Biology
Faculty Sponsor: J.P. Happey

This study was done to examine the relationship between increasing psychological stress and salivary Immunoglobulin A (IgA) concentrations in Albion College students. Saliva samples were collected from, and stress questionnaires were completed by, subjects during both a stressful period (e.g., final exams) and a relatively non-stressful period. Nephelometric analysis was used to assay IgA levels. A significant inverse relationship was found between the participants' reported stress levels and their corresponding IgA levels. Previous studies have shown that the decreased IgA levels often found in people experiencing stress can lead to more frequent and severe illnesses.

Drake, Katie, '96

The Influence of Managed Care, Specifically HMOs, on the Ability of Physicians to Provide Quality, Preventive Care

Major: Biology
Faculty Sponsor: Richard Marsiglio

This research focuses on the effects that managed care, specifically through HMOs, has had on the ability of physicians to provide effective, preventive care. I began my study by reviewing the historical changes that have occurred in the United States' health care system in the last forty years. The introduction provides preliminary research and background on the current U.S. health care crisis, and includes a brief description of the economic, social, and governmental issues surrounding the system. From this historical information, a questionnaire was constructed, and a randomized survey from a compiled list of 300 Albion College alumni was performed. The questionnaires were mailed in January of 1998 to 150 Michigan physicians. By March 6, 1998 there were 64 responses to this survey (a 43% response rate), and of the respondents: 21 were primary care physicians (PCPs), 34 were non-primary care physicians or specialists, 5 were retired PCPs, and 4 were retired specialists.

The data suggest that Michigan physicians participating in HMOs have not been prepared for the expectations of managed care, are limited by cost-containment measures in the types of treatment they can provide, and believe the current system of managed health care needs to be greatly improved. These physicians also believe that through managed care, patients are not being seen by the most capable and appropriate physicians for quality care. The results demonstrate that managed care has drastically influenced physicians' abilities to provide quality, preventive care.

Gavord, Heather, '96

The Effect of Gender on Perceptions of Candidates in a Resume Evaluation Session

Major: Psychology
Faculty Sponsor: William Hayes

This study examined the effect a candidate's gender has on his or her likelihood of being selected for an available employment position. There were three conditions in which participants examined a resume and supported material from a male, female, or a candidate whose gender was unknown. They then rated the candidate on several characteristics related to their ability and chances of being hired. Specifically, the data yielded significant results on the measures of likelihood of being hired, competence, appropriateness of previous employment background, potential for leadership, and the likelihood of being a parent. In that the male candidate received significantly higher ratings than those of the female candidate, while the candidate for whom gender was unknown generally fell between the two. Significant results were also obtained on the measure of time. The female candidate was rated as likely to engage in typical female activities, the male typical male activities, and the gender-unknown candidate engaged in a mixture of the two.
Georgi, Ilise, '98

An Analysis of Thomas Mann's Novella, Mario and the Magician

Majors: Chemistry and German
Faculty Sponsor: Ingeborg Baumpfeiffer

Known worldwide, Thomas Mann is considered one of the most inspiring German authors of the twentieth century. His works, characterized by intricate and often complicated insight into the world, society, and the relationships between people, include Buddenbrooks, Death in Venice, The Magic Mountain, Joseph and His Brothers, Mario and the Magician and Der Zauberer, among others.

Mario and der Zauberer, like most of his works, has been interpreted over the years from many different angles, and many critics have seen a wide range of messages and symbolism in the novella. In this research project, I have attempted to explore and analyze some of these interpretations as well as state my own.

In Mario und der Zauberer the story is of a German family that travels to Italy on vacation and describes their unusual encounter with a magician, Cipolla, who visits the town one summer night.

Within the happenings and symbolism, can be found interpretations of the homoerotic nature of men, political allegory for the workings of a Fascist society and how Fascist might come to be, and also a representation of the power exchange between two men, or one man and a society. It is these major aspects of the novella that will be explored in this project.

Gilman, Amanda, '98

Properties of a Thermophilic Cellulase from Thermotoga maritima

Majors: Chemistry
Faculty Sponsor: Robert Armstrong

Cellulase is a polymer of glucose molecules that makes up the majority of biomass, as well as the majority of waste created by human activity. It can be degraded into individual glucose molecules by an enzyme, cellulase. Glucose, in turn, can be fermented into fuels and chemicals currently obtained from fossil fuel sources. The enzymatic degradation of cellulose, therefore, could help reduce the amount of space needed for waste disposal and the reliance on nonrenewable resources. Most cellulases have very low activity on crystalline, insoluble cellulose, the type of cellulose found in biomass. A major goal of this study is to find a cellulase with higher activity on insoluble cellulose.

One area that is being researched for more active cellulases is extracellular, enzymes that come from organisms that thrive outside the range of conditions (pH, temperature, pressure) in which most living things exist. This paper describes the characteristics of a thermophilic ("heat-loving") cellulase from the thermophilic bacteria, Thermotoga maritima. This cellulase is unique with only 38.7% homology to known cellulases. The optimal pH for its activity on barley beta-glucan, carboxymethyl cellulose, p-nitrophenylcellobioside and Avicel, a microcrystalline cellulose, is pH 5.0, although the pH at which it is most stable after being heated for one hour at 80 degrees Celsius prior to reaction with substrate is 6.0. The optimal temperatures for hydrolysis of these substrates range between 70 and 85 degrees Celsius. Far outside the range in which most living things can survive. When native cellulase is heated to a solution with nanopure water, it has high thermal stability at 80 degrees Celsius. One of the cellulase's unique features in its high activity on barley beta-glucan, at least twice as much activity as the most active mesophilic glucanase. There may be combinations of other enzymes and the T. maritima cellulase, either in synergistic reaction mixtures or coupled through chemical reactions, that would increase the activity level on crystalline cellulose.

As of yet the exact mechanism of action of the Thermotoga maritima cellulase is unknown. However, analysis of the products of hydrolysis of insoluble cellulose and various sugars with high performance liquid chromatography shows that the major product is cellulose which indicates an exoglucanase mode of action.

1998 Isaac Student Research Symposium
Our Justice and Jury System: Factors Affecting the Public’s Perception of Fairness

Major: Psychology
Faculty Sponsor: Amy Ora

Researchers have neglected to examine what affects public perception of justice. This 2 (Verdict) X 2 (Evidence) x 2 (Time) study investigates the effects specific procedures have on public perception of fairness. The participants read a newspaper article describing a murder trial. In the articles, the jury either acquitted or convicted, reviewed or did not review evidence, and deliberated three hours or three days. The participants rated the fairness of the justice system, media, jury verdicts and deliberations, and the defendant’s character. The results are consistent with research indicating procedures are more important in determining fairness than verdict or defendant characteristics. The results support the hypothesis suggesting deliberation and review of evidence are two jury procedures affecting public perception of the fairness of trials and jury verdicts. This research indicates the actions of the justice system throughout the trial rather than the verdict or the media affect public perception of justice.

Haar, Daniel, ‘98

Rorty and Nussbaum: The Idea of the Self

Major: Philosophy
Faculty Sponsor: Gene Ora

Philosophers today are, for the most part, in a general agreement that the traditional metaphysical idea of the self as a spiritual soul trapped in a physical body is a bankrupt notion. Yet besides this consensus, there is still wide variation among different kinds of philosophers. For instance, postmodernists believe that, with the end of metaphysics, the ideas of “true” and “knowing the world” are now useless, whereas they claim that there is no such thing as a self. Other philosophers, who still believe in the usefulness of science, look to empirical studies which point to the commonalities between humans all over the world to shed some light onto what is the human self.

Richard Rorty is an example of a postmodernist philosopher. In his book Contingency, Irony, and Solidarity he makes the claim that there is no inherent human nature, or “core self” because “socializing goes all the way down.” Yet later on, he states that it is important for political discourse to “notice our similarities” with other humans. Yet if Rorty claims that the world cannot be known, and that all human nature is contingent upon history, then how can we find our similarities with others?

Martha Nussbaum, in her article “Human Capabilities, Female Human Beings,” makes a list of what she believes to be the necessary and sufficient conditions to be human. A philosopher like Rorty would attack Nussbaum for being universalistic. Yet it is not Nussbaum simply following Rorty’s advice of “noticing our similarities.”

Rorty discounts metaphysical natures but also does not allow for the practical uses of the scientific method. For accounting for disease, developing technology, and predicting natural phenomena, physical- and natural science “work the best.” Yet Rorty is only willing to call science another form of literature, just like poetry and fiction.

I would argue that Rorty is mistaken to take such a naive stance on the importance of science. While any “truth” we “discover” is necessarily imperfect due to the imperfections in language and human short-sightedness, it does not mean we should dispense with these ideas altogether. I would also argue that Nussbaum does a good job completing Rorty’s task of “noticing our similarities.” While this list of the components of “human nature” is by no means perfect or complete, it cuts across many cultural boundaries.

1998 Isaac Student Research Symposium
A Comparison of the Retention of Year-Old Fruit in Two Species of Sumac, Rhus typhina and Rhus glabra.

Major: Biology
Faculty Sponsor: Dale Kennedy

Staghorn sumac (Rhus typhina) and smooth sumac (Rhus glabra) are closely-related plant species that both produce bird-dispersed, low-quality fall fruits. These species compensate for having low-quality fruit by having high rates of fruit retention; thus their fruits are available for birds during winter and spring when other food sources are scarce. Sumac may retain their fruit clusters for many years. Casual observations indicated that smooth sumac appeared to retain a greater number of fruit clusters than did staghorn sumac.

During the winter of 1997-1998, I did a quantitative survey of fruit retention in 10 clones of each species in south-central Michigan. In each clone, I scored fruit clusters from the previous year to determine the percentage of fruits remaining after the 1996-1997 winter usage period. Smooth sumac had a significantly higher mean retention of fruits than did staghorn sumac (32% vs. 10%, respectively; P=0.005). These results indicate that staghorn sumac may be a preferred food source for birds. This preference could indicate birds are selecting for greater nutrition, for different types of fruit presentation, or away from non-nutritional chemicals in the fruit pulp. Alternatively, these data may suggest a greater droppage rate in staghorn sumac.

The Effects of Exposure to Made-for-TV Films on Perceptions of Victims of Violence

Major: Psychology
Faculty Sponsor: Amy Otto

Purpose: This study was designed to examine the effects of what two different types of victim scenarios, women as a perpetrator (WP) and women as a victim (VV), have on mock juries' reactions to a rape trial.

Procedure: Thirty-one undergraduate students from Northeast Missouri State University and 11 undergraduate students from Albion College were randomly assigned to one of five conditions. Group 1 viewed a WP film, WP film, then a mock rape trial.

Group 2 viewed the WP film, then the trial. Group 3 viewed a WP film, VV film, and then a mock rape trial. Group 4 viewed a VV film followed by the trial, while Group 5 only viewed the mock rape trial. Before and after each film, subjects completed a Mood Affective Adjective Check List (MAACL), and after viewing the rape trial, completed a questionnaire measuring attributions of victim blaming, liking for the victim, and their verdicts.

Results: The movies viewed affected people's perceptions of the victim in trial situations. Specifically, subjects' level of anxiety, depression, and hostility were at an increased level when entering the trial phase of the study, in contrast to their emotional state at the beginning of the study. The movies viewed also affected people's perception of the victim in trial situations. When WP was viewed last, subjects were more apt to believe that the victim could have avoided the situation and that the victim did deserve the abuse. Furthermore, subjects exposed to both films were more likely to find the defendant guilty than those exposed to only one film.

Conclusion: While a great deal of attention has been focused on the media's influence on potential jurors due to print publicity, researchers have not focused much attention on the general effect the media may have on potential jurors by means of everyday programming. Potential jurors' beliefs about victims of crime are not only being influenced by case-specific media coverage, which a judge might handle by using a change of venue, or issuing a gag order, but possibly more important, their beliefs are being influenced by the media that they are most frequently exposed to every day through TV programming. Obviously more attention needs to be given to this kind of media influence, so that its effects can be considered in court proceedings.

1998 Isaac Student Research Symposium
Haywood, Pamela, '98

Archaeological Geology of the Duck Lake Site

Major: Archaeological Geology/Geological Sciences
Faculty Sponsor: William Basile

The Duck Lake archaeological site (ca. 1700 B.C.) has yielded projectile points, copper tools, unworked copper pieces, animal bones, and hearth features. The materials used in the making of these tools range from exotic chert to local quartzite and chalcedony. The site itself is believed to be a transition between the Middle Archaic Period and the Late Archaic Period as it relates to the Upper Peninsula of Michigan.

The purpose of this study is to determine the climatic and geophysical setting of this site by analyzing paleontological and geological data gathered at and near the site.

Jacobs, Jennifer, '98

Microbial Removal of Chloroorganics from Dilute Gaseous Waste Streams

Major: Chemistry
Faculty Sponsor: Jack Crump

Many industries produce volatile organic compounds (VOCs) in dilute gaseous waste streams that must be removed before being released into the environment. A viable alternative to incineration or adsorption is bioremediation, by which an aerobic microbial consortium enriched from methanotrophs use gaseous VOCs as their sole carbon source and degrade them in carbon dioxide. Previous research at Oak Ridge National Laboratory has shown that this type of approach is effective for treating a wide variety of alkenes including the use of a trickle-bed bioreactor.
The investigations of this project have been
devoted to biodegradation of chlororganics, specifi-
cally, chloropentane and chlorobutane. The goal of
this project was to model previous research of
bioremediation of alkanes and apply it to the
bioremediation of chlororganics via the trickle-bed
bioactor. In trickle-bed bioactors, chlororganics
are passed over a biofilm-coated packing at which the
chlororganics are degraded. The scope of this work
was to study the degradation of chlororganics in
small bench microcosms, to determine the feasibility,
and to study the removal of chlororganics in trickle-
bed reactors.

Experiments have enabled us to examine and
balance the chloropentane-oxygen reaction to
determine the effects of different chlororganic
concentrations on the microbial consortium. From
the results, it is concluded that for every mole of
chloropentane, the reaction requires 4.5 mole of
oxygen and produces 82.7 g of biomass.

Jageman, Robert, '96

Dretske and the Challenge of Misrepresentation

Major: Philosophy and Cognitive Sciences
Faculty Sponsors: Had Garvin and Goldie Chaker

In a series of major books and articles, Fred Dretske has
advanced a representational theory of mind (RTM)—a theory that postulates an equivalence
("plus or minus a bit") between mental phenomena and
natural systems of representation (Conscious, 1).

For Dretske, a natural system of representation is a
physical system that has an intrinsic function of
indicating some condition in the world. Dretske’s
RTM is thus an attempt to naturalize the mind—to
demonstrate an equivalence between mental proper-
ties and physical properties. To support his theory,
Dretske has been concerned with demonstrating that
the properties and characteristics commonly attrib-
uated to beliefs can also be attributed to natural
systems of representation.

One property of belief that Dretske has been
particularly concerned with is its apparent capacity
to misrepresent—to be false. His goal has been to
show that natural systems of representation, as he
defines them, also have the capacity to misrepresent.
In doing so, Dretske identifies the capacity to
misrepresent with the capacity to fail in the perfor-
man ce of an indicator function. Whether or not
natural systems of representation have this capacity
depends on what types of indicator functions they
have. Dretske argues that a natural systems of
representation capable of associative learning have
fixed, finitely indicator functions. Thus, all natural
systems of representation capable of associative
learning have the capacity to misrepresent. This is an
important conclusion for Dretske, because it butt-
resses his case for an equivalence between natural
systems of representation and one type of mental
phenomenon (belief).

In this thesis, I explicate and clarify Dretske’s
account of misrepresentation. I then argue that it
leads to counter intuitive ascriptions of representa-
tional content. On Dretske’s account, natural systems
of representation capable of associative learning turn
out to represent their own reactions to the external
world. Although this allows for the possibility of
misrepresentation (such systems can be wrong about
how they will react to the world), the overall picture
of natural representation Dretske presents is not one
that resembles our everyday conception of belief.
Given that Dretske’s primary goal is to demonstrate
an equivalence between belief and natural representa-
tion, this does not seem like an acceptable result. I
suggest that the problem lies not with Dretske’s
account of misrepresentation but with his implicit
assumption that a naturalized account of mind will
reveal that mental states have determinate content.

Johnson, Laura, '98

The Role of Ha-Ras in Mast Cell
Granule Morphology and Intracellular
Movement

Major: Biology
Faculty Sponsor: Patricia Weiss

The purpose of this research is to determine whether
Ha-Ras is involved in the intracellular movement of
granules during the process of degranulation and to
investigate the role of this protein in mast cell granule
morphology. Mast cell granules were analyzed for
the presence of Ha-Ras in the membranes and for the
content of the granules to analyze their morphology.
The results will be discussed during the presentation.
Johnson, T. Scott, '98

Strength and Conditioning Program for Swimmers
Major: Physical Education
Faculty Sponsor: Keith Stevens

In recent history, Albion College swimming has not had strength and conditioning as a component of the conventional training regimen. With swimming becoming a sport where outcomes are determined by a hundredth of a second, it is now necessary to go beyond just traditional methods of training. Complex training adds a new component to traditional weight and strength training by adding asymmetries to the conditioning of the athlete. This new component adds the explosive and powerful aspect to many sports, specifically swimming, that gives an edge to competitors.

Jones, Michael, '96

Taxonomic Placement of Henriettea squamulosa (Meiastomataceae: Miconiaceae) based on ITS Ribosomal DNA Sequences
Major: Biology
Faculty Sponsor: J. Olin Sear, Jr.

Henriettea squamulosa (Cogn.) Judd is a small tree endemic to montane forests of Puerto Rico. It was first described by Alfred Cogniaux as Calycolpus squamulatus Cogn. in 1886. A century later Walter S. Judd transferred the species to the genus Henriettea DC., primarily based on common growth pattern and architecture, and the presence of megayield crystals in the leaves, the latter characteristic of Henriettea species and absent in other species of Calycocarpum DC. To test the hypothesis that this placement would be supported by comparison of DNA sequences of internal transcribed space (ITS) regions from H. squamulosa and species of Calycocarpum and Henriettea, total genomic DNA was isolated, and ITS regions of 185-265 nucleic ribosomal DNA were amplified and sequenced from field-frozen leaves of H. squamulosa, H. ruscifolius (Sw.) Gomes-Mata, and H. marfaufiusi (Triana) Alain from Puerto Rico, and leaves of greenhouse-grown specimens of Calycocarpum inquinalum Cogn. and Sapium furtius, both collected on Hispaniola. An unidentified species of Miconia Ruiz & Pav. from Mexico was used as the outgroup. Cladistic analysis of the six aligned sequences (660 bases) yielded 105 possible trees. A branch-and-bound search yielded one most parsimonious tree which was 250 steps long (Consistency index = 0.902; Consistency index removing uninformative characters = 0.758; Retention index = 0.703). Based on this study, Judd's placement of C. squamulums in the genus Henriettea is supported.

Krabach, Todd, '99

Gaussian Quadrature in Two Dimensions
Major: Mathematics
Faculty Sponsor: Scott Dillon

Gaussian quadrature is a well understood technique for numerical integration in one dimension. By selecting special Gauss points, we can approximate a definite integral with a summation using

\[
\int f(x) \, dx = \sum_{i=1}^{W} A_i \cdot f(q_i)
\]

where \(A_i\) are weights associated with the Gauss points \(q_i\). The weights and points depend upon the value of \(n\). It can be shown that this approximation is exact for polynomials of degree less than or equal to 2n-1, and the rate of convergence for arbitrary smooth functions is \(h^n\).

This process is easily extended to rectangles for the two-dimensional case. Constructions of the original Gauss points and weights are used to get the following approximation

\[
\int f(x,y) \, dy \, dx = \sum_{i=1}^{W} A_i \cdot A_j \cdot f(q_i, p_j)
\]

This approximation is once again exact for polynomials of degree less than or equal to 2n-1, and the rate of convergence is \(h^n\).

We extended this notion of Gaussian quadrature to triangles. The question was what should we pick for points and weights. We explored scaling the points and weights used for a rectangle first in the \(x\) direction and next in the \(y\) direction. To try to get a better approximation, the average of the two methods was used. In all three cases we found that our method was exact for all polynomials of degree less than or equal to 2n-1 but was not exact for some polynomials of degree equal to 2n-1. However, it was the case that the rate of convergence was found to be the optimal \(h^n\).
Kudirla, Elizabeth, '98

The Word as Power in the Works of Isabel Allende

Major: Spanish
Faculty Sponsor: Purnima Mohab

My project is an analysis of four novels and one collection of short stories by the Chilean author Isabel Allende. I have analyzed these novels to find the significance that communication plays in the lives of the characters, especially the female characters. Communication acts as a means of obtaining power in two senses: It enables characters to take power in interpersonal and intrapersonal relationships, and it also allows them to achieve political power despite oppressive governmental regimes.

The final section of my thesis deals exclusively with the book Paula, which Allende wrote originally as a letter to her daughter Paula, who was in a coma. After Paula's death, Allende eventually published the letter, which is very autobiographical and tells much about her writing career and the purpose behind her writing. I was inspired to do this project two years ago while studying one of Allende's short stories. The story deals exclusively with a woman who uses her knowledge of words to gain both political power and personal power over a man.

I have discovered in the course of the project that Allende has based much of her writing on her life. She has personally used her writing to deal with her experiences and to spread her views around the world, thus gaining indirect political power. There is only a small amount of criticism written on Allende's writing, since her first novel was published less than twenty years ago. This project approaches her work from an angle that not many have explored and will add to the growing body of work on her writing.

LaCasse, Shawn, '98

Acquisition of MS/MS Reference Data of Industrial Chemicals by Ion Trap Mass Spectrometry

Major: Chemistry
Faculty Sponsor: Lisa Lewis

The U.S. Army and other agencies of the Department of Defense have a continuing interest in the development of MS/MS instrumentation and software as part of their field detection of chemical and biological agents and trace verification missions. Experiences during the Gulf War have suggested a need to characterize possible exposure to hazardous industrial chemicals as well. MS/MS instruments have the ability to selectively detect compounds in the parts per billion (ppb) and the parts per trillion (ppt) range. Because of this high selectivity and sensitivity, these instruments are excellent tools for the detection of industrial chemicals, environmental contaminants and chemical agents.

To help aid in the development of field identification methods, the need for a reference MS/MS database has arisen. The assembly of this database is being sponsored by Oak Ridge National Laboratory (ORNL) and the Defense Special Weapons Agency (DSWA). The database is comprised of three major programs: Microsoft Access, Unix Based, and Java/Draw.

Through the use of an ion trap gas chromatograph-mass spectrometer (GC/MS), reference spectra from various lists of industrial chemicals were recorded. These spectra include MS and MS/MS spectra of the major ions formed by electron ionization (EI) of compounds including phosphonates, substituted benzenes, halogenated alkanes and alkylphosphate esters. Pertinent information about the chemicals such as molecular weight, experimental conditions, and name synonyms are also included in the ORNL/DSWA database.

Lathim, Stephen, '98

Reconceptualizing the Ghetto

Major: American Social Policy
Faculty Sponsor: Len Berney

The amalgam of problems associated with ghetto neighborhoods—welfare dependency, teen pregnancy, single parenthood, education and achievement, gang violence, and the like—are subjects of intense debate among social analysts. The dominant academic analyses of the ghetto are examined, and ultimately rejected, on the basis of their grounding in classical sociological theory. Instead, a Weberian-inspired analysis, one that recognizes multiple spheres of power in the social order, proves more useful in our attempts to understand and approach the ghetto.
Lemcke, Mary, '98

GIS Analysis of Vertebrate Diversity with Respect to Climate

Major: Geological Sciences
Faculty Sponsor: William Barnes

The geologic record clearly shows that the earth's climate regularly shifts between warm and cold periods. Our current climate has changed rapidly over an alarmingly short period of time with record high temperatures occurring across the globe. To better understand this present warming trend we can study past climates using paleontological data, comparing fossil vertebrate distributions to the distributions of living vertebrates.

The purpose of this study is to develop vertebrate diversity criteria for paleoclimatic analysis for tropical and subtropical regions. Vertebrate diversity, vegetation, and climate data were gathered for Australia, South America, and the Yucatan Peninsula for comparison of climate sensitive vertebrate distributions with respect to the climate parameters of precipitation and temperature. The vertebrates chosen for this study are crocodilians, lizards, and turtles for Australia and the Yucatan Peninsula and only crocodilians for South America. The vertebrate, vegetation, and climate data for each area were spatially and statistically analyzed using Geographic Information System (GIS) software. The geographic and plot analyses for each area were compared to fossil data for the final climate analysis.

Distribution maps were made for each vertebrate group showing the number of species within that group that can be found at any particular point within the area of study. These maps are then compared to (regressed against) climatic maps in order to analyze the relationship between vertebrate diversity and climate. The X-Y plots of vertebrate diversity versus climate (and vegetation) can then be used to make predictions about ancient climates as reflected in the diversity of the fossil faunas.

Marlowe, Emily, '98

Children's Facework in Social Predicaments

Major: Psychology
Faculty Sponsor: Barbara Keyses

Fifth-grade and sixth-grade participants were asked to read four scenarios, each depicting a social predicament in which the participant was the offender and a same-sex classmate was the victim. The scenarios varied by blameworthiness (high and low) and closeness of relationship between offender and victim (friend and acquaintance). Participants were then asked to write an account of what they would say to the victim for each scenario. Other factors that were expected to affect the results include the sex, self-regulatory style, and sociometric status of the participant. Account elements were coded into four main categories of concessions, excuses, justifications, and refusals. Analysis was then performed to determine if the above factors affected various aspects of the account including length of account, type of account elements used, complexity of account, and number of lies. Participants' situational self-esteem and their expectations about the future outcome of the situation were also measured.

McCackren, Molly, '98

The "Eyes" Have It: Vision in the Novels of Laura Esquivel

Majors: Economics/Management and Spanish
Faculty Sponsor: Pamela McNabb

In my research on the novels Como agua para chocolate (Like Water for Chocolate) and La ley del amor (The Law of Love), both written by Laura Esquivel, I explore the use of vision in depth, principally as a means of transmitting emotion. This project suggested itself due to the highly visual quality of the two novels. Much of the novels' progress depends on types of non-verbal means of communication. There are four visual concepts which function as a means of emotional expression: the gaze from one person to another, a mutually exchanged gaze, blindness (both literal and figurative), and crying. This study is significant because it helps to explain how Esquivel's background as an author of movie scripts influences her fiction.
McKeachie, J. Ryan, '88
A New Photochemical Method for the Production of Polypropylene
Major: Chemistry
Faculty Sponsor: Craig Bower

Polypropylene is a conductive polymer that is generally synthesized by electrochemical or chemical oxidation of the polymer monomer. Unfortunately, these synthetic methods do not provide satisfactory means for coating surfaces of any type due to the insoluble and infusible nature of the polymer. Recently, we have seen that photolytic synthesis is a promising surface-coating method for polypropylene. Polymeric material can be formed interior of a geez sample cassette filled with a solution of pyrene in CCl4 where intense 300 nm light from a xenon arc lamp-strikes the cell. New solution absorbances develop at 340 and 460 nm, accompanied with a noticeable solution color change from colorless to bright yellow. Infra-red UV-visible spectra, conductivity, and solubility of the photolytic product have been compared to those of polypropylene synthesized in the lab by oxidation using a variety of oxidizing agents.

Minnesota, Timothy, '88
The Effects of Larval Xenopus laevis Xenografts on Spinal Cord Crush Injuries in Ambystoma maculatum
Major: Biology
Faculty Sponsor: Richard Mottinisen

To find the effects of fetal neural tissue transplants on the recovery of function after the spinal cord has received a crushing injury, spotted salamanders (Ambystoma maculatum) received grafts from South African clawed toad larvae (Xenopus laevis). The salamanders were injured by vertebral dislocation of the tenth and eleventh thoracic vertebrae. Incisions were made, exposing the spinal cord. Neural tissue from the tailpods was removed and injected into the injured tissue in the experimental salamanders. The hind leg function of the subjects was measured before surgery and at two-day intervals beginning the day of the surgery. The control salamanders regained complete function after nine days and survived for more than two weeks. The experimental salamanders never regained function, and all had died after six days.

These results show that fetal interspecies grafts inhibit the natural recovery process in Ambystoma maculatum. It also suggests that cellular grafts may be detrimental to the recovery of function after the spinal cord has received a crush-type injury.

O'Brien, Thomas, '88
"Progress Is Albion's Future": A History of the West Central Urban Renewal Project
Major: History
Faculty Sponsors: Wesley Dick and Larry Breinhauer

In 1965 the Albion City Council voted, in the face of substantial community opposition, to enter into a contract with the federal government to carry out an urban renewal project on the city's primarily black west side. The West Central project, as it came to be called, was to displace approximately 150 families and thirty individuals in an attempt to eliminate "slum" conditions and prepare the west side land for redevelopment. From the outset the project ran into several obstacles—poor communication between the various local and federal agencies; lack of standard, low-income housing in which to relocate the displaced residents; failure to attract private contractors and developers; and lack of cooperation from neighborhood residents were just a few of the obstacles faced by the city's urban renewal department. Many of these problems were similar to those faced by urban renewal projects across the nation, while others were particular to small cities such as Albion. As an example of both community opposition and federal enforcement on local power, the West Central project was one of the most controversial events in the history of Albion, and the impact of the project on the city's west side is highly visible even today.

Petruzs, Jaime, '88
Investigation of the Photoxidation of Carbon Tetrachloride by Titanium Dioxide Using GC/MS with Headspace Sampler
Major: Chemistry
Faculty Sponsor: Lisa Lewis

Titanium dioxide (TiO2) will photoxidate volatile organic compounds in water and holds promise as a technique for remediation. The photodegradation of carbon tetrachloride (CCl4) by TiO2 (340 nm) was analyzed using gas chromatography-mass spectrometry (GC/MS). Previous study of the kinetics of CCl4 photodegradation used alternate methods of analysis, such as single ion electron monitoring of chlorine evolution. This investigation explored the use of GC/MS with headspace sampler as a more complete method of analysis, allowing for identification and quantification of both products and reactants.
Probert, Kelly, '98

Physical Education Leads to Life Patterns of Physical Activity

Major: Physical Education
Faculty Sponsor: Darrell Soderstrom

Purpose: To discover whether what is taught in physical education is being utilized throughout life. To find out what activities people are doing once they are no longer in a physical education class. Method: Survey of staff and faculty members. The next step was to compile and compare results.

Significance and Results: Physical education is important but value of the major activities people are participating in are not taught in physical education until college if at all.

Raiston, Jennifer, '98

The Catholic Church and the Third Reich During the Pre-War Years, 1925-1939

Major: History and Religious Studies
Faculty Sponsor: Frank Frick

The Catholic Church has been placed at two polar ends of the spectrum of fault in relation to the Holocaust and the Nazi regime in Germany. Some scholars claim the Vatican had prior knowledge of Hitler’s plan of genocide against anyone of non-Aryan descent. Others claim that the Catholic Church was duped by the Nazi leader, and it was merely an innocent victim in his onslaught against the world. This thesis will try to balance both arguments and show how the fault of the Catholic Church during World War II is neither completely nor nonexistent.

The Catholic Church could have made a stronger stand against the treatment of the Jews, Roma, and political prisoners in Germany, yet the Pope and the Vatican were placed in a terrible situation. Either the Catholic Church would disengage completely from the political sphere of influence in Germany, or it would risk losing the freedom of the Church, its petitioners, and the Catholic organizations in Germany. Neither of these options was the first choice of the Catholic Church, yet the church was forced into choosing a disagreeable option.

This thesis will show how the history of anti-Judaic vestigient, the political arm of the Catholic Church in Germany (Catholic Center Party), the 1933 Concordat between the Holy See and the Reich Government, and the violations of this Concordat shaped the circumstances under which the decisions of the Catholic Church were made. This thesis’ goal is not to answer the question of the degree of guilt of the Catholic Church on these issues, but to present a balanced argument so the reader can make an informed decision.

Rudoske, Loretta, '98

People’s Perceptions of the Battered Wofnan and Her Batterer

Major: Psychology
Faculty Sponsor: Velasquez Martinez

This study examined the general population’s perceptions of the battered woman and her batterer. Two hundred forty undergraduates were given a scenario, along with a questionnaire, to determine whether their perceptions of the battered woman and her batterer were either negative or positive. The scenario developed for this study included three factors which were believed to have an effect on the participants’ perceptions. This study used a between-subjects, 2 (scenario: one woman’s reaction to prior abuse) X 3 (family-activity) factorial design. Analyses included factor analysis, reliability analysis, and several analyses of variance (ANOVA). Implications of such research is discussed.

Sedlak, Cara, '98

Economic Considerations for Equal Access to the Civil Justice System

Major: Political Science
Faculty Sponsor: Allan Horsman

Americans have come to rely on the legal system to work through almost every type of dispute imaginable. Consumers sue to receive compensation for damages caused by faulty products. Neighbors sue neighbors regarding overhanging tree limbs. Employees sue employers because of sexual harassment. Stockholders file class action suits against corporation management. Neighborhood associations appeal zoning decisions. Use of the legal system has become an integral part of American culture.

This reliance on the legal system has contributed to an increase in the different abilities of the rich and the poor to obtain relief. The legal system, in theory, is an excellent venue for fair dispute resolution.
However, the system cannot live up to this potential unless all persons are treated equally under the law. Unfortunately, litigation is very costly; the poor cannot afford to utilize the legal system in the manner which Americans of higher economic status have become accustomed.

To help combat this inequality, attempts have been made throughout history to provide organized legal assistance to the poor. Beginning with private charities and eventually leading to governmental funding, legal aid has been around since the late 1800s. Originally, aid was seen as a privilege and indeed only enjoyed "worthy" procedures for those deemed "deserving." Federal government involvement, which began in the 1960s, changed the outlook to use of the legal system to attack the underlying causes of poverty. As years passed and the idealism of the 1960s faded, government-funded legal assistance shifted to pursue the expansion of individual access to justice.

The result has been a decreasing viability for community impact litigation, particularly for poorer communities. Without access to government dollars, poorer communities cannot afford to bring forth litigation which might potentially benefit a large number of residents. Because the Legal Services Corporation can no longer finance class action lawsuits, these communities have been forced to make use of alternative funding options.

Whereas funding include finding a lawyer willing to take the case pro bono or under a contingency fee arrangement, seeking reimbursement for attorneys' fees under statutes including such provisions, attempting private funding, seeking use of cost minimization strategies, and applying for assistance from public interest groups. Each of these solutions has obstacles which make financing community impact litigation very difficult. The obstacles are heightened for poorer communities. Coupled with the American reliance on the legal system, these obstacles stand in the way of justice through equality under the law.