RYERSON UNIVERSITY

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impact

A celebration of scholarly, research and creative activity / Summer 2006

Ryerson is proud to present the winners of its fourth annual Graduate Student Research Article Competition. The goals of the competition are to make research accessible to the general public and demonstrate the value of investment in university research. The 2006 winners are:

- **First prize, sciences**: Jon Bahen, MASc student in Mechanical Engineering
- **First prize, social sciences and humanities**: Ryan Bigge, MA student in Communication and Culture
- **Second prize**: Cheryl Thompson, MA student in Communication and Culture
- **Third prize**: Irene Berkowitz, PhD candidate in Communication and Culture

Their essays are excerpted in this special issue. Full versions can be found on the Office of Research Services website at ryerson.ca/ORS, under "Showcase." The competition is supported by the Natural Sciences and Engineering Research Council of Canada (NSERC) SPARK program, Ryerson's NSERC representative, the School of Graduate Studies, the Office of Public Affairs and the Office of Research Services.

BEST OF GRADUATE STUDENT RESEARCH ARTICLE COMPETITION

President Sheldon Levy (third from left) congratulates winners of the 2006 Graduate Student Research Article Competition at a reception hosted by the Office of Research Services. From left: Jon Bahen, Ryan Bigge, Cheryl Thompson and Irene Berkowitz.

Walk without pain

New surgical procedures could reduce risk of orthopedic surgery

1st SCIENCES

By Jon Bahen

Supervisor: Professor Z. Saghir, Department of Mechanical and Industrial Engineering.

Co-Supervisors: Dr. M. Papini, Department of Mechanical and Industrial Engineering, and Dr. K. Behdinan, Department of Aerospace Engineering.

The Canadian population is aging; no one can deny this. Boomers are beginning to bust. Since immortality is not yet an option, an ever-growing percentage of our population is succumbing to the inevitable effects of age. This means more "routine" surgeries are necessary to keep our bodies in tip-top shape. The only problem is that these routine procedures are not as everyday or easy as they seem. They are major operations that can involve major complications. With over 45,000 Canadians receiving hip and knee replacements every year, if even a small percentage of these operations cause negative side effects, thousands of Canadian lives can be disrupted, not to mention the resulting strain on our already burdened heath care system.

One such procedure that accompanies hip replacement surgery is the use of intramedullary reaming to increase the contact area between the bone and the implant. This essentially involves using a reamer, a specialized drill, to remove a layer of bone to facilitate the insertion of a tight-fitting implant. The applied forces associated with this procedure generate frictional heat, leading to thermal damage of the cortical bone. When damage is sustained to this bone, a patient's healing time can be impeded or halted entirely. If a procedure could be designed to reduce or eliminate the chance of injury due to this heat while maintaining the effectiveness of intramedullary reaming, hip and knee replacement surgery would not only become routine, but also risk-free.

Initially, I examined experimental studies that have shown a temperature of 47 C, sustained for at least one minute, can cause irreversible damage to bone cells and hinder the healing process. With each bone taking three to six minutes to be reamed completely, the chances of a problem-free recovery are exponentially diminished. With only a 10-degree increase from normal human body temperature causing this extreme trauma, an effective reaming method must be designed. The method must ensure the stability that reaming provides to the implant is continued, while also maintaining an acceptable temperature level.

Our team attempted to solve this problem using computer simulations that accurately replicate the temperature distribution in the bone throughout the reaming process. Using published analytical models that predict the temperature of the reamer face when rotating in a stationary position, and incorporating it into a moving Computational Fluid Dynamics simulation, we were able to predict the temperature at all locations of the bone, during every second of the procedure, to locate areas at risk of damage. Employing an experimental reaming procedure conducted on miniature pig tibia bones, we were able to verify the accuracy of the model.

With this verified model, we can make predictions regarding the effects that the rotation rate, the force used or the cut thickness would have on the bone temperature at all locations. Modifying these parameters will allow us to design the optimal procedure that will permit surgeons to complete operations in less time while not exceeding the temperature where damage is certain. Expediting hip and knee replacement procedures is vital as there are long waiting lists for these life-changing operations. While the duration of the operation is important, patient safety is imperative and cannot be compromised for any reason. These procedural designs must consistently balance efficacy with safety. Thus prompt and risk-free operations will allow the greatest number of Canadians to walk without pain and lead longer, more enriched lives.

As research and development continues, more advanced and accurate models will be created to further optimize hip and knee replacement procedures. Until that time, the results I have obtained through my research on intramedullary reaming will reduce wait times, free up coveted hospital beds and add a little extra bounce to the step of more and more Canadians every year.

Depravity sells

Vice magazine profits from the shock market

By Ryan Bigge

Supervisor: Dr. J. Burwell, Department of English.

1st SOCIAL SCIENCES & HUMANITIES

In darker moments, I fear that my master's thesis will suffer a fate similar to "Bubbles Galore" or "Where Did My Ass Go?," two artistic projects attacked by Opposition members of Parliament for receiving grant money from the Canada Council for the Arts. Taxpayers may not be happy to learn that the focus of my academic rigour is a Montreal magazine called *Vice*. Over its 10-year existence, *Vice* has certainly lived up to its title, condoning graphic sexuality, drug use and various types of criminal activity. The editorial staff also like to smash the boundaries of various taboos, including racism, homophobia and the portrayal of the mentally ill.

Oh, and *Vice* once used a photograph of a dead rat on their cover.

But realistically, I know that the likelihood of a government official taking umbrage at my thesis is statistically improbable. Even the most determined of wonks will be hard-pressed to read beyond the cover page of a 100-page thesis entitled *The Vice Squad: Problematizing Authenticity and Transgre$$ion*. Which is too bad. *Vice* might be a brier patch of filth and depravity, but it's a very profitable brier patch.

While *nostalgie de la boue* ("nostalgia for the mud") and *Salon des Refusés* (Salon of the Rejected) aren't exactly new concepts – both emerged in the French bohemia of the 19th century – they serve much different purposes today. Back then, transgressive expressions were meant to serve an explicit political function (along with shocking polite society). Today, the sick, the strange and the repellant can be successfully leveraged to turn a profit in the cultural arena, politics be damned.

Vice, despite its grotesque subject matter and visceral visual style, is a financial juggernaut, with editions in the United States, the United Kingdom, Australia and Japan. Crime might not pay, but depictions of excess have enabled *Vice* to build an international brand that includes a record label, clothing stores and various movie and television projects. Certain politicians might find the content morally depraved, but *Vice* pays plenty of taxes and is stimulating the economy (while at the same time stimulating the prurient interest of its readership).

As you might imagine, *Vice* fascinates me as often as it repels. Sometimes it does so simultaneously. But studying *Vice* provides me with an opportunity to take my six years of experience as a freelance journalist and combine it with sustained academic critique to examine how the cultural, the social and the economic can collide in strange ways.

My thesis supervisor, Jennifer Burwell of Ryerson's Department of English, has provided me with plenty of inspiration, especially since some of her recent work has involved a consideration of *South Park* and other "stupid humour" shows that use irony as a shield for deflecting criticism. As Dr. Burwell likes to remind me, my work on *Vice* won't reduce air pollution or help formulate new approaches to the search for renewable energy alternatives. But by investigating how depictions of transgressive behaviour can be used to sell shoes, clothing and CDs, I am trying to demonstrate how the cultural air we all breathe is flecked with moral, social and financial particles that we inhale constantly, but that remain, for the most part, invisible. And that is as shocking as anything *Vice* can manage to publish.

BEST OF GRADUATE STUDENT
RESEARCH ARTICLE
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impact

One nation under hip-hop's groove

2nd

"Keeping it real" in Canadian society

By Cheryl Thompson

Supervisor: Dr. J. Brayton, Department of Sociology.

When you consider that in the early 1980s, the music industry thought hip-hop was a passing fad, what is it about the genre that speaks to the world?

While this competition is a tremendous opportunity to share my work, I can't help but wonder, "What makes my research more important than the next?" Since there is no definitive answer to that question, this article is my attempt to explain why I think my forthcoming thesis, *Situating Hybridity and Searching for Authenticity in Canadian Hip-Hop: How do we 'keep it real'?*, is important to everyone, not just academe.

Usually when I tell people about my research, they assume I am a die-hard hip-hop fan. While I love hip-hop, my interest in the genre stems more from sheer wonderment at its global reception. Like most people, I knew that hip-hop grew out of economically and socially deprived New York City neighbourhoods in the late 1970s (*Rose, 1994*), but until I commenced this project, I had no idea that local hip-hop with native lyrics exists in faraway and divergent countries such as Australia, Germany, Zimbabwe, Switzerland, Italy, France, Aotearoa/New Zealand, Spain and Greece (*Maxwell, 1997; Bennett, 1999; Mitchell, 2000; Androutsopoulos and Scholz, 2003*). When you consider that in the early 1980s, the music industry thought hip-hop was a passing fad, what is it about the genre that speaks to the world?

Canada's appropriation of hip-hop can be traced back to Maestro "Fresh" Wes and his 1989 hit *Let Your Backbone Slide*. Since Maestro, Toronto-based artists Kardinal Offishall and K-OS have become the voices and faces of our domestic hip-hop scene. But, as my thesis supervisor and fellow hip-hop enthusiast Jennifer Brayton of the Department of Sociology has shown me, hip-hop exists in other provinces, too. For example, artists like Dogmatique (Montreal) and Jay Bizzy (Halifax) are superstars in their provinces, but to the rest of the country, they remain relative unknowns. Does that mean that their hip-hop is less Canadian than the aforementioned artists?

In the United States, rapper Chuck D has called hip-hop "the black CNN" for the ways in which the music comments on social problems, political issues and sexuality of black culture. Hip-hop scholar Kembrew McLeod's (*1999*) research found that issues in the community with which a hip-hop artist and fan identifies him or herself serve as arenas of contestation. That is, artists' "sense of not forgetting where they come from" defines what it means to "keep it real" in socio-economic terms (the streets versus the suburbs), social-psychological terms (staying true to yourself versus following mass trends), racial terms (black versus white), political-economic terms (underground versus commercial), gender-sexual terms (hard versus soft) and cultural terms (old school versus the mainstream).

Culturally speaking, Canada is considered a mosaic, while the U.S. is seen as a melting pot. If that is true, how does Canadian hip-hop "keep it real"? Is our sense of "not forgetting where we come from" based on American terms, or are ethnic-cultural terms (cultural ethnicity versus Canadian hegemony versus regionalism) more reflective of our country?

Ultimately, my research has less to do with hip-hop as a musical genre as it does with Canadian sovereignty. How does Canadian hip-hop reflect our ethos, our political community and our national and regional identities? It has been said that music is one of the few art forms that bonds people together regardless of race, ethnicity, socio-economic class and gender. If that is so, Canadian hip-hop might just be the thing that unifies us as, in the immortal lyrics of Funkadelic, *One Nation Under a Groove*.

I owe a great deal to Dr. Brayton, who receives funding from Ryerson's New Faculty Research Start-Up Fund, for she has shown me the error of my Toronto-centric ways.

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Television drama

Changing the way Canadian production firms do business

3rd

By Irene Berkowitz

Supervisor: Dr. C. Davis, Edward S. Rogers Sr. Research Chair in Media Management and Entrepreneurship, School of Radio and Television Arts.

While American drama is the most watched and most profitable content on the planet, Canadian drama is the least watched and least profitable content on our screens.

Pierre Elliot Trudeau's 1969 remarks to Washington's National Press Club are famous: "Living next to the U.S. is in some ways like sleeping with an elephant…one is affected by every twitch and grunt." Yet the world has changed dramatically since 1969, particularly in the broadcasting arena – what might the former Prime Minister say about Canada's relationship to the United States today?

Since 2000, sweeping changes in distribution technologies have threatened the structure and economic viability of the once robust global broadcasting industry. With our national neighbour's unquestioned media dominance, Canada's broadcasting industry is one of the most vulnerable to the fallout of technological convergence.

As a result, Canada and its television drama production firms are in a position of unique risk. While American drama is the most watched and most profitable content on the planet, Canadian drama is the least watched and least profitable content on our screens. Drama, however, is critical to every nation as cultural storytelling. These issues concern Canadian taxpayers who, according to a 2003 report by the federal government, subsidize approximately half the costs of English Canadian drama production. Therefore, research to explore ways to strengthen Canada's drama producers in the digital age is critical to our cultural identity.

Although the Canadian situation is derived from unique factors of low population and close proximity to the U.S., the issue is complicated by historical tension between Canada's protectionist rhetoric and the actuality of broadcast regulation. In contrast to saving Canada from American television, the viability of Canada's broadcast system is tied to the simultaneous substitution of Canadian for American advertising, a financial underpinning of our nation's broadcast system. It is estimated that simultaneous substitution boosts revenues of Canadian broadcasters by nearly 30 per cent, thereby subsidizing the production of Canadian drama.

Put simply, the problem for Canada is that geographic rights have little value in the digital age. The new distribution technologies do not respect national borders; they are global distribution methods. A recent report on the broadcast industry by Canada's Ministry of Heritage acknowledged concern that "the existing programming model, which has become overly reliant on the cross-subsidization of Canadian revenues through revenues generated by American programming, will eventually collapse."

A threat of this magnitude has never occurred in the history of Canadian broadcasting. While the 1951 Massey Report, which warned of an "American invasion," set a certain rhetorical tone, the facts show the Canadian Radio-television and Telecommunications Commission assessed a nation with too few people to sustain an unregulated broadcasting industry, and designed effective measures to construct and protect a market. It worked; today there are 679 television services with revenues of $3 billion.

Throughout its history, Canada's drama production firms have been insulated by the reliable demands of the domestic market, which required broadcasters to televise Canadian drama and delivered government funds to subsidize production costs. Canadian drama ratings were rarely reviewed; they were mostly dismal. Ironically, recent incentives which reward Canadian broadcasters for achieving better Canadian ratings, place drama producers under additional pressure to accurately sense shifting domestic market dynamics, as well as rapidly evolving international market realities.

My research will profile Canada's 148 television production firms and their market orientation, which is critical to survival in the changing arena. Drawing on studies of market orientation, and related concepts of strategic approach and competitive advantage, the study will explore the worldview of the chief executive officers of Canada's drama production firms via surveys and in-depth interviews. The research will identify key market-orientation factors that these firms believe impact their survival in today's industry.

In the years since Mr. Trudeau framed his powerful metaphor, official rhetoric has tended to couple "pro-Canadian" with "anti-American" while our system quietly depends on the Canadian television audience being "pro-American." Perhaps it is time to recast our broadcasting relationship with our largest trading partner, with whom we share a 3,000 mile undefended border and an increasingly precious, democratic way of life.

In the 21st century, perhaps sleeping next to an elephant is no disadvantage at all. Perhaps Canada's sleeping has been the problem, not the existence of the beast. Canada could rebrand itself as having the best location of any country on the planet, with respect to developing strength in TV drama production. Perhaps Canada can choose to dance, rather than sleep, with the elephant.