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Murder by numbers



New research by forensic psychology professors Michael Woodworth (left) and Stephen Porter could help police generate predictions about the characteristics of a killer – or killers – based on the crime scene evidence and victim.

Researchers compare the crimes and minds of individual vs. multiple killers

BY JODY JACOB

Crime investigators such as the RCMP, FBI and even the CIA have powerful new knowledge at their disposal to potentially help solve murders, thanks to a ground-

breaking study involving UBC Okanagan forensic psychology researchers. Their findings could help police generate predictions about the characteristics of a killer – or killers – based on the crime scene evidence and victim.

The study, *Partners in Crime: A Comparison of*

Individual and Multi-Perpetrator Homicides, looked at 124 cases of convicted Canadian male offenders – a third of the cases involving multiple people during the crime – to determine what the crime scene could reveal about the nature of the suspect, and the likelihood of

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Building with gingerbread

Engineering students put holiday delight to the test

BY HILARY THOMSON

Ever wondered if your gingerbread house will still be standing by Christmas? Well, worry no more – a couple of UBC engineering students have analyzed the material's structural strength in a series of "laboratory" tests.

As part of a second-year Integrated Engineering program, Mercedes Duifhuis and Sean Heisler explored how gingerbread stands up to pressure. Their 31-page report, *Structural Analysis of Gingerbread*, earned them an A+. And they got to eat the results.

"We'd made some gingerbread when we were studying a few months earlier," says Duifhuis. "We pitched the prof on testing gingerbread as an architectural material and he went for it."

Integrated Engineering is a multidisciplinary program with a strong focus on team-based engineering design. Other class proposals included an automatic washer/dryer for the ping-pong balls used to play beer-pong, a water-conserving barista sink and a hamster wheel speedometer.

"Allowing students to propose project ideas lets them

branch off into their specific fields of interest," says course co-instructor Leo Stocco of UBC's Dept. of Electrical and Computer Engineering. For Duifhuis and Heisler that meant materials engineering with Heisler being particularly interested in test design and development.

"If students can apply their learning to something they care about, they will care about learning," says Stocco.

Using a recipe found in the 1986 cookbook *Sweet Dreams of Gingerbread* by Jann Johnson, the duo made batches of dough that used fat as the test variable, adding either butter, margarine or shortening to determine which ingredient optimized structural strength. Their analysis is full of tables, diagrams and calculations and covers elements such as design, budget, and environmental impact, noting that "excess gingerbread . . . is biodegradable and very delicious with icing."

The students considered testing an entire gingerbread house, but knew the icing that holds such edible edifices together would confound and

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IN THE NEWS

Highlights of UBC media coverage in November 2009. COMPILED BY SEAN SULLIVAN



UBC Thunderbirds women's field hockey 2009 CIS champions

Ocean Lady a 'wake-up call'

When an unflagged ship bearing the name Ocean Lady arrived at British Columbia's shores in October, international media turned to UBC Law Prof.

Benjamin Perrin for analysis.

Perrin, also a faculty fellow at the Liu Institute for Global Issues, told the *Globe and Mail* he suspects the passengers may have paid tens of thousands of dollars for passage from Sri Lanka. "The unfolding story strongly suggests that this incident is part of a sophisticated international migrant-smuggling network," he said.

Perrin told *CTV* that identifying these migrants accurately is a heavy responsibility.

"A post-conflict scenario creates a real opportunity for terrorists, war criminals and former combatants to simply blend in with civilians."

Perrin also spoke to *Agence France-Presse*.

UBC takes women's field hockey title

The UBC Thunderbirds won a record-setting 12th CIS women's field hockey title last month with a 6-0 gold-medal win over the Alberta Pandas, *TSN* reported.

The Thunderbirds' triumph is their first since 2006 and gives them one more McCrae Cup championship than the University of Victoria and two more than Toronto.

"This is the game we've been

dreaming of," Robyn Pendleton told *TSN*. "It's a pretty good way to finish a season. As a team we did really well and we finished our opportunities, which ultimately made all the difference."

Men and arousal

Fox News reported on a recent study from UBC that found that while most men can regulate their physical and mental sexual arousal to some degree, the men most able to do so are able to control their other emotions as well.

"We suspect that if an individual is good at regulating one type of emotional response, he/she is probably good at regulating other emotional responses," said **Jason Winters**, the study's research head, told the *Live Science* wire service. "This has never been shown before."

Participants had to control their response to 16 randomly ordered video clips, half of them erotic, the other half funny. The study found that the men who were best able to control their response to the pornographic videos were also able to control their response to the funny video.

Winters said the next step is to do a similar study with sexual offenders. "I suspect that sexual offenders will generally be very poor regulators, and that poor regulation is one of the factors that contributes to their offending," he said.

The thesis goes online

The *Globe and Mail* reported on an ambitious project at UBC that will see more than 33,500 master's theses and doctoral dissertations put online.

"You never know what is going to be of interest to someone somewhere somehow down the road," university archivist **Christopher Hives** told the newspaper.

Since the fall of 2007, postgraduate students have been able to file their theses and dissertations electronically, a process Hives compares with filing income tax online.

Diet speeds healing

Researchers have found a diet high in fat and low in carbohydrates speeds recovery in rats with spinal cord injuries, *UPI* reported.

Dr. Wolfram Tetzlaff of the University of British Columbia told the wire service a diet high in fat and low in carbohydrates, known as the "ketogenic" diet, is already used as a therapy for epilepsies.

Previous research showed fasting is beneficial after partial cervical spinal cord injury in rats, but the strategy was unpopular with patients and clinicians, Tetzlaff said. The researchers investigated the ketogenic diet as a fasting alternative because, as in fasting, a lack of carbohydrates forces the body to use fat as fuel. ■

Murder by numbers *continued from cover page*

multiple perpetrators being involved.

"It was the first empirical study of this nature," says Stephen Porter, professor of psychology at UBC Okanagan and a practicing forensic psychologist. "We really had no literature to draw upon to come up with predictions, so it was very exploratory in nature."

Porter and the team analyzed victim characteristics, sexual violence, sadistic/gratuitous violence, instrumentality vs. reactivity (premeditated vs. spontaneous violence), motive, weapon use and the role of psychopathy.

two-thirds of their victims were male adults.

■ The crimes of multiple perpetrators were generally premeditated, well-planned and with a clear goal in mind – often some sort of retribution, money or drugs.

■ Individual perpetrators were much more likely to target adult females, and although there was usually some level of premeditation, there was a lot of emotion and anger present that wasn't found with the multiple perpetrator killers. They also were much more likely to engage in gratuitous violence, such as torture.

"When we looked at murder by multiple perpetrators, in general, these guys were younger – on average mid-20s – whereas the individual killers tended to be mid-30s, and ranging into their 40s, 50s and 60s."

"Although it was a carefully done scientific study, it has clear practical applications," says Porter. "It can give police a better understanding of these types of crimes as well as offer suggestions regarding the type of suspect, or suspects, they are looking for in a particular case. It would help them get a quick sense of who they are dealing with."

Quick indications about who to look for are important, Porter says, because in Canada 70 per cent of solved homicides between 1991 and 2005 were cleared within one week of the incident, with the likelihood of success dropping drastically after that time.

Porter's co-investigators were **Marcus Juodis**, a PhD student at Dalhousie University with a background in domestic homicide reviews, **Michael Woodworth**, associate professor of psychology at UBC Okanagan, and **Leanne ten Brinke**, currently working on her PhD in the area of forensic psychology at UBC Okanagan. The team finished data analysis in 2008, and published the findings in the current issue of the psychology journal, *Criminal Justice & Behavior*.

"We were surprised to find that murders by single individuals were dramatically different from murders by multiple perpetrators in a number of ways," says Porter. "For example, there were demographic differences. When we looked at murder by multiple perpetrators, in general, these guys were younger – on average mid-20s – whereas the individual killers tended to be mid-30s, and ranging into their 40s, 50s and 60s."

Some other findings suggested:

- Multiple perpetrators tended to target male victims who were acquaintances – more than

■ For individual male murderers, the victim tended to be either an adult stranger or a former partner.

■ The older males tended to act individually, while a significantly higher percentage of younger offenders acted with at least one accomplice.

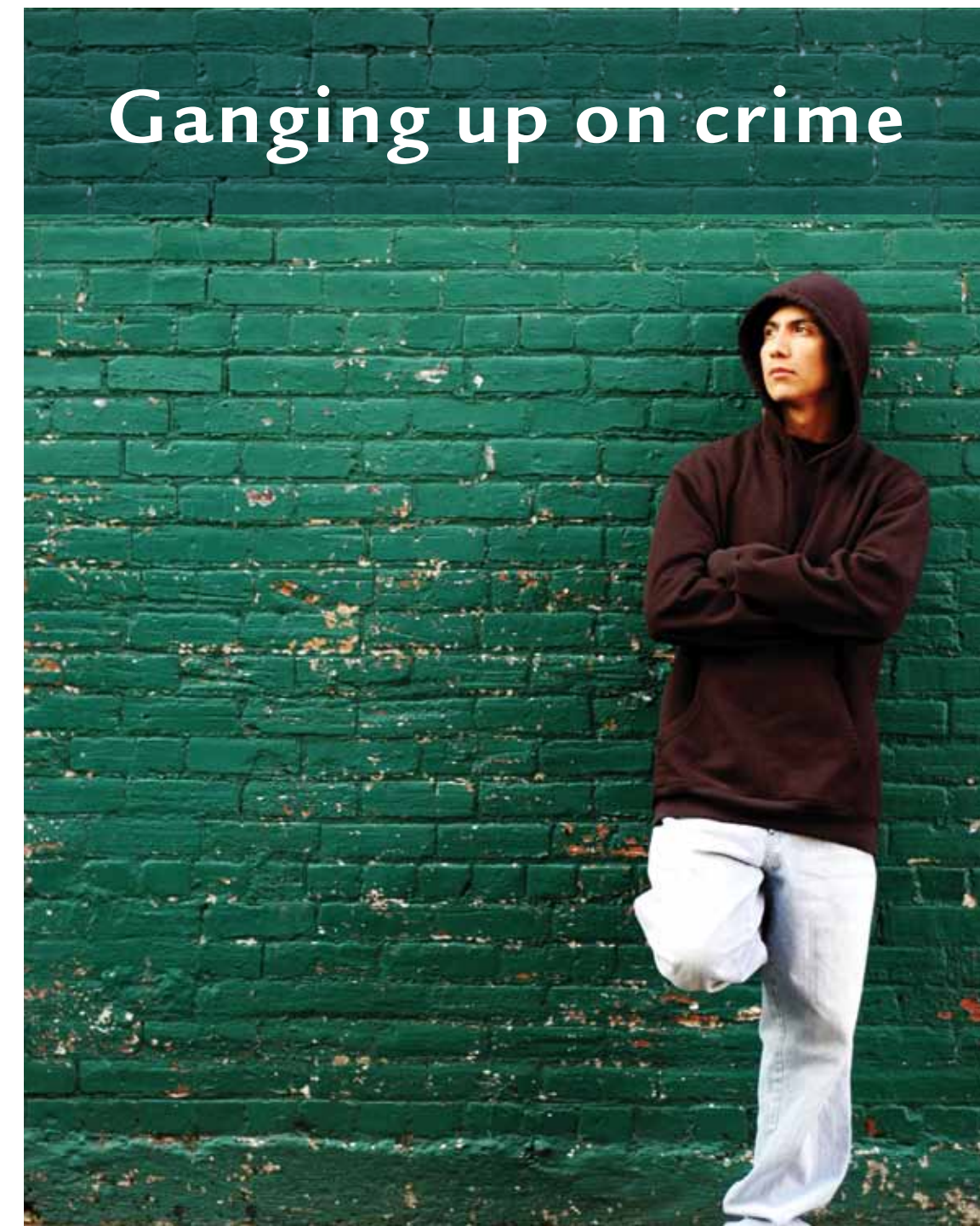
"And one really interesting point that we found was that multiple perpetrators' preferred method was to kill a victim with firearms and they were very unlikely to engage in 'hands-on' methods like strangulation," says Porter. "We found the opposite pattern with individual killers, whose preferred method of homicide was strangulation or stabbing."

When the researchers looked at how psychopathy played a role in a murder, they found that individual psychopaths typically used strangulation and left evidence of sadistic violence, even curiosity-driven post-mortem violence. They suspect that for multiple-perpetrator crimes, there will typically be a psychopathic individual who, through his keen manipulation skills, is able to convince peers to engage in heinous behavior.

"We already know something about how psychopaths do murders alone, but we suspect that with many multiple-perpetrator crimes there is probably a ringleader – a psychopathic fellow – who is convincing others to do his dirty work," Porter says.

Both Porter and Woodworth strongly hope their research will reach law enforcement groups and other legal professionals. To learn more about this science, and about training opportunities, visit their websites <http://michaelwoodworth.ca/> and <https://people.ok.ubc.ca/stporter/Welcom.html>. ■

Ganging up on crime



How do gangs influence homicidal behaviour among youths? That was one of the questions asked in a follow-up to the *Partners in Crime* study.

UBC Okanagan forensic psychologist **Michael Woodworth** and clinical psychology PhD student **Ava Agar**, who studies at the University of Saskatchewan, set out to learn what, if any, differences existed between youth (ages 12-17) who committed homicides and adult offenders, factoring in many of the variables used in the adult study, including the individual versus multiple perpetrator angle.

"Multiple perpetrator homicide has more than tripled in the last 20 years compared to what was reported between the early '60s and early '80s," says Agar. "Given how much emphasis has been placed on increases in gang membership and gang-related crimes, we wanted to see whether or not this could explain why multiple-perpetrator homicides had increased so dramatically in just 20 years."

With the support of **Dr. Heather Gretton** of Youth Forensic Psychiatric Services in Burnaby, B.C., the team analyzed data from cases involving 105 youth who had been convicted of murder.

"Very few researchers in the world have had access to such a large sample of youth homicides and have been able to explore and research them in a very detailed, systematic, empirical and scientific manner," says Woodworth.

One of the most significant differences between the adult study and the youth study was that 67 per cent of the youth sample participated in multiple-perpetrator homicides, compared with

33 per cent of the adult sample.

To the researchers' surprise, the study suggested that youth who belong to official gangs committed about the same number of homicides as non-gang members of the same age, regardless of whether they were alone or with other offenders. That is, gangs did not explain the high number of accomplice-assisted homicides.

"Youth who belonged to more seemingly innocuous delinquent groups – groups that do not self-define as gangs, but gather for the purposes of engaging in criminal activities nonetheless – engaged in significantly more accomplice homicides," says Agar. "In fact, youth who belonged to such groups were three and a half times more likely to commit homicide with accomplices."

Woodworth and Agar have presented their findings at conferences for crime investigators in Canada and Italy, and have been invited to present their work at a large RCMP conference next April in Vancouver.

"The data can be used by all sorts of individuals, but first and foremost we think it has real applications for intervention," says Woodworth. "If we can understand more about what's motivating these youth – why they are committing particularly violent crimes – it can certainly help aim our treatment goals with these youth and provide a better idea of the issue of treatability in general."

"We're hearing more and more about the influence of gangs at the youth level," Woodworth says. "I think the data can also help law enforcement better understand the dynamics with multiple-perpetrator crimes at the youth level." ■

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Odes to the Olympics



PHOTO: MARTIN DEE

UBC student composer Jared Miller's playful ode to Olympic construction will be performed by the Vancouver Symphony Orchestra.

BY BASIL WAUGH

After seven years of Olympic construction, it's fair to say Vancouverites know a little something about jackhammering and piledriving.

So when the Vancouver Symphony Orchestra premieres *2010 Traffic Jam*, a playful ode to the cacophony of Olympic construction by UBC student composer Jared Miller, expect everyone in the house to recognize the source material.

Miller, whose short composition will be performed by the VSO on Dec. 5 at the Orpheum, says his piece was inspired by the daily impact on people's lives by major Games-related construction projects such as the Canada Line, Olympic Village, Convention Centre and Whistler Highway.

"I wanted to capture the bombastic sounds and emotions coming from the construction and traffic," says Miller, a fourth-year UBC School of Music student who had plenty of time to think about

his masterpiece as his commute inched along Cambie St. during the Canada Line dig. Concert-goers can expect trumpets imitating car horns, real sirens and other literal effects, he says.

The 20-year-old Miller is the youngest of five emerging composers from across

earlier this year. He says the biggest challenge was keeping to the VSO's desired length of around three minutes.

"If you are composing for a full orchestra, that's like summarizing a 60-page Master's thesis paper down to one page," he says.

The second UBC student to win a VSO

"I wanted to capture the bombastic sounds and emotions coming from Olympic construction and traffic."

Canada selected by the VSO to compose orchestral music inspired by the 2010 Winter Games – and one of two from UBC. With funding from the B.C.

government, each winner gets their music performed by the symphony at least twice and receives an \$800 honorarium and a professional recording.

Miller wrote his piece over four months

2010 commission is Ryan Trew, whose work will premiere at the VSO's *Cosmic Masterpiece* performance on March 13, just as the Paralympics begin.

While Miller's piece explores the earthly delights of Olympic roadwork, Trew's composition *Starlike* is celestially inspired, drawing parallels between the 400th anniversary of Italian astronomer Galileo

Galilei's first cosmic discoveries and how the Games may impact the world's understanding of Vancouver.

"The Games will illuminate Vancouver's virtues and our challenges," says Trew, 30, of his lush, ethereal work. "Like Galileo's telescope or any major world event, the Games are forcing us to question ourselves and our priorities, helping us to face a new self-perception as a city."

For tickets to Miller's and Trew's Dec. 5 and March 13 premieres, visit: vancouverSymphony.ca.

UBC is a host competition venue for 2010 Olympic hockey and Paralympic sledge hockey and UBC Robson Square, the university's downtown campus, will house unaccredited international media.

Learn more about UBC 2010 research, education programs and venues at: ubc.ca/2010media.

UBC School of Music: music.ubc.ca
Ryan Trew's MySpace: myspace.com/ryantrewmusic

GINGERBREAD continued from cover page

confuse their findings.

"One of the surprises in doing this assignment was how a project as seemingly trivial as gingerbread can showcase so many engineering fundamentals," says 20-year-old Heisler, who plans to pursue a career in project management. "Education isn't just formulas – something fun can include important learning."

The first challenge was standardizing the shape and thickness of the gingerbread pieces. After many frustrating attempts in their lab, a.k.a. Heisler's kitchen, they created samples in a variety of shapes, including mini I-beams – tiny versions of the girders that resemble a capitalized letter I.

Once the material was ready, the students designed several tests. In addition to a density test, a tensile strength test looked at how the material performed

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Preparing for the unexpected: Games responders supported by UBC simulation system



PHOTO: MARTIN DEE

Electrical Engineering professor José Martí leads a team that has created a system that models essential services.

BY ERINROSE HANDY

Imagine it's the final minute of the gold-medal match, and Team Canada scores a goal. GM Place starts to shake. You think it's the excitement of the packed arena and the reverberations of the applause – but it keeps shaking – you realize it's an earthquake.

Will there be a power outage? How will the facility be evacuated? Where will injured people be taken?

A UBC team is imagining just such a scenario during the upcoming 2010 Olympic Games and answering these questions using software that models essential services and utilities during a disaster. Led by UBC Electrical Engineering professor José Martí, the Infrastructures Interdependencies Simulation (I2Sim) team aims to minimize human suffering should a disaster occur.

I2Sim was chosen by Defence Research and Development Canada to assist in planning and real-time decision support for the Vancouver 2010 Olympic Games.

Adapted specifically for downtown Vancouver, I2Sim's role includes modeling utilities, responders, venues and hospitals; running simulations with public data; and assisting responders.

Developed by a team of experts from electrical and computer engineering, civil

GINGERBREAD continued from page 4

under tension; a cantilever beam test measured bending strength; and a compression test evaluated gingerbread's reaction to crushing forces.

The tensile test was the hardest to execute, they say. It involved clamping a piece of gingerbread at one end while the other was attached to a hanging weight. Formulae were used to determine the failure levels of stress and strain of the material. Numerous trials led Duifhuis to conclude, "Gingerbread is not very good in tension – it's just not stretchy."

engineering, computer science, geography, commerce and psychology, I2Sim models the interaction of infrastructure systems – the things we rely on for normal city life – food, water, safety and order, healthcare, finance, electricity, telecommunications, transportation, government and defense. I2Sim simulates and predicts how a disaster may compromise any one or several of these systems, and allows for

and it is on a peninsula, so bridges must be safe to travel to other hospitals. Many factors must be modeled at the same time."

With key input measures in place, the software can immediately evaluate the evacuation needs of GM Place, the availability of beds at St. Paul's Hospital and the best route to get there, and provide contingency if St. Paul's is damaged or full.

"This is a tool that can be employed in any area of the world in the event of a disaster. It can save lives."

planning and real-time human decision-making support during a dynamic crisis scenario.

For example, if an earthquake rocks GM Place during a game, the software immediately models the dynamic situation and advises managers of essential workers such as paramedics, doctors, engineers and transportation managers how to best proceed to minimize human suffering.

"The Olympics in Vancouver provides some specific challenges," says Martí.

"In developing exit strategies, you must consider many fans may not speak English. There is one hospital downtown,

Martí explains that on one level, this project is about combining engineering skills with human needs, and on another, about decision-making when resources aren't sufficient.

"The overriding question is, how do we balance needs in critical decision-making situations?" says Martí. "It's essentially an optimization problem with the goal of ensuring human lives and minimizing impact."

The I2Sim tool assigns value to limited resources and allocates them to the most essential areas, helping curtail a cascading collapse of infrastructures and escalation

of an emergency, thus optimizing what is available at any given time. Understanding the interdependencies of critical infrastructures is essential to mitigating the impact of a crisis, and is at the core of I2Sim's effectiveness.

UBC Engineering faculty members have played essential roles in the project. Principle Investigator Martí understands the capability of the simulation tool and the expertise of the team. Civil Engineering professor Carlos Ventura contributes a keen understanding of structural damage and extensive experience in earthquake engineering. Electrical and Computer Engineering professor KD Srivastava provides expertise from his years of organizational experience. The team employs two professional engineers, one for programming and one for project management.

I2Sim includes a team of 12 graduate and undergraduate students.

"It has been tremendously motivating to work on I2Sim," says Hugón Juárez García, a civil engineering PhD candidate. "Certainly being part of the Olympics is exciting, but ultimately, this is a tool that can be employed in any area of the world in the event of a disaster. It can save lives. What greater reward could there be?"

The 19-year-old has always liked to build things. A finalist in a North American Lego construction contest while in Grade 6, she is contemplating a career in architecture.

The report describes the compression test as "subjecting the material to crushing forces until failure was induced." The pair loaded all of Heisler's textbooks in a stack about a metre high on a sample piece of gingerbread – until the cookie crumbled.

Of all the tests, the researchers deemed the cantilever beam test most important

as "it directly corresponds to typical gingerbread applications." In a three-point bending test, a gingerbread beam was suspended across a known span (between counters) and centrally loaded with a hanging weight. Dough made with margarine did best on this test.

So of the three fats, which is the best ingredient for architectural gingerbread?

The report states that samples made with butter, although the tastiest of the three according to the researchers, "exhibited a very ductile quality through

compression." In other words, too squishy. Beams made with margarine failed under compression, but were quite good in bending applications. Shortening was declared the best – but least scrumptious – fat for gingerbread construction.

Classmates consumed the construction materials in a post-presentation repast.

More information on UBC's Integrated Engineering program may be found at <http://www.igen.ubc.ca/about/index.php>.



Integrated Engineering students Mercedes Duifhuis and Sean Heisler subject gingerbread to cantilever stress test.

PHOTO: MARTIN DEE

UBC centre leads the way for low-carbon communities



Choosing to cycle, rather than drive, is one way to cut greenhouse gas emissions, says the UBC Design Centre for Sustainability.

BY SEAN SULLIVAN

A new 100-year sustainability plan that takes a holistic view of North Vancouver's environmental impact has netted a prestigious award for that city and the UBC Design Centre for Sustainability.

The centre, based in the School of Architecture and Landscape Architecture, aims to bridge the gap between the applied research carried out at the university and the practical tools communities need to create a low-carbon future.

The plan considers how the city can achieve the provincial greenhouse gas emissions reduction target of 80 per cent by 2050, despite an expected increase in population and jobs.

The project brought together researchers, municipal staff, citizens and local stakeholders to consider energy consumption and associated greenhouse gas emissions. Looking at mobility, density, water use and the long-term livability of the area, the 100 Year Sustainability Vision is one model of how university research can make a tangible

necessarily associated with high costs or negative side effects," she says. "There are many effective actions that can be taken to reduce greenhouse gas emissions that are low cost, such as providing incentives for people to walk or bike to the store instead of driving."

Just through land use and transportation, it's easy to reduce greenhouse gas emissions by 50 per cent, Campbell says. "We need to start building communities so they are denser. Can you live closer to where you work, or walk to meet

"Whether it's increasing housing density, improving public transit, or community-centre spaces, we need to make sure that the solutions fit the problem."

As communities struggle to find ways to reduce their environmental footprint, the participation of research initiative such as the UBC Design Centre for Sustainability may be the key to a low-carbon future.

"Cities generally don't have the institutional knowledge it takes to implement a variety of programs that really work, and that work together," says executive director Elisa Campbell. "Whether it's increasing housing density, improving public transit, or community-centre spaces, we need to make sure that the solutions fit the problem."

The North Vancouver plan earned the Union of BC Municipalities' Community Excellence Award for Leadership and Innovation.

impact in B.C. communities. "UBC's work is out there in the real world," Campbell says. "Conversely, we're bringing the knowledge we learn from our community projects back into the research environment."

One of the challenges faced by the program is convincing people of the need to act now. "The long-term effects of climate change are beyond the purview of a normal person," Campbell says. "Most people have bought on to the whole sustainability thing, but when push comes to shove, and when tradeoffs start to emerge, commitments become a little weaker."

Those tradeoffs don't always have to be negative, she notes. "Better lifestyles and low-carbon communities are not mutually exclusive or

most needs? If not, do you have access to efficient and accessible transit?"

The North Vancouver case study sits within a larger project called Sustainability by Design, a collaborative effort to produce a compelling visual representation of what Greater Vancouver region might look like in 2050, at neighbourhood, district and region-wide scales. The centre is presently embarking on a case study with the District of Langley.

"We want to come to the point where sustainability can actually be implemented into communities by using the tools we have created, based on research from UBC," Campbell says. ■

Fertility drug may be a bitter pill



Evidence suggests fertility drugs contribute to increased rates of multiple pregnancies, which have a higher risk of problems for newborns.

BY HILARY THOMSON

Making babies with the assistance of fertility drugs helps couples create families, but do we really understand all the impacts of these treatments?

Sarka Lisonkova doesn't think so. A post-doctoral fellow in the Dept. of Obstetrics and Gynecology, she is launching the first population-based study in North America to examine trends in use of the fertility drug clomiphene and its impact on birth outcomes.

"There is extensive research on more invasive assisted-reproductive techniques such as *in vitro* fertilization, but less is known about the effects of fertility drugs," she says. Research results will help prospective parents, health-care providers and health-policy experts with decision-making.

Clomiphene, introduced in 1965, stimulates the ovaries to trigger release of an egg. It is widely used to treat fertility problems such as those associated with advanced maternal age (older than 35). Evidence from Europe suggests that such fertility drugs may be the most significant contributor to increased rates of multiple pregnancy.

"We don't really know what's happening in Canada but we do know the increase in multiple births is being called a perinatal disaster because of the elevated risk of pregnancy complications and problems for newborns," says Lisonkova, a trainee at Vancouver's Child & Family Research Institute and a member of the Women's Health

Research Institute.

Fetal, newborn and infant mortality rates are four to 10 times higher among twins and triplets than single births, and

clomiphene use among B.C. women from 1996-2006. The research will capture data on approximately 1.1 million women aged 20-55

parents need to carefully evaluate the pros and cons of delayed childbearing and the use of these powerful drugs." Research resources

Data BC that captures health and demographic data on all residents; and the BC Perinatal Health Program database registry that has information on all births at 20 weeks of gestation or more.

Lisonkova works with perinatal epidemiologist Dr. K. S. Joseph, UBC professor of obstetrics and gynecology and a scientist at the Child & Family Research Institute. Her research was funded by the Michael Smith Foundation for Health Research. ■

"The increase in multiple births is being called a perinatal disaster because of the elevated risk of pregnancy complications and problems for newborns."

cerebral palsy rates are at least eight times higher. Pregnancy complications of multiple births include higher incidence of pre-eclampsia or toxemia, gestational diabetes, low birth weight and developmental difficulties. In addition, there is higher risk of the mother dying.

There are efforts to regulate techniques such as *in vitro* fertilization to ensure a singleton pregnancy. However, it is impossible to regulate the number of eggs released during ovulation stimulation, which can result in multiple pregnancy.

Assisted reproductive technologies of all kinds have led to an increase in multiple births in Canada. The rate of twins increased by 50 per cent – from 19 per 1,000 in 1985 to 29 per 1,000 in 2004. The relative increase in triplet and higher order multiple births has been more substantial, with the rate increasing by 175 per cent from 42 per 100,000 births in 1985 to 115 per 100,000 births in 2004.

Lisonkova will use population-based pharmaceutical and health-related data to evaluate

and a total of 360,000 births. Pregnancy and birth outcomes of women using fertility drugs will be compared to those who conceive spontaneously, looking at issues such as differences in occurrence of multiple pregnancies, congenital anomalies, preterm births, newborn deaths, and miscarriage.

Although couples bear the costs of assisted reproduction techniques, including fertility drugs, Lisonkova says the impacts of the drugs are a public issue because the consequences of those choices are publicly paid for. Multiple Births Canada, a national support group, estimates that health-care costs for one set of premature twins is approximately \$130,000 from birth to discharge. Costs include more frequent pre- and post-natal monitoring, specialized birthing procedures such as caesarean delivery and intensive care of newborns.

"We can't control reproduction entirely and assisted reproduction is not always the easy answer that some might think," says Lisonkova. "Prospective

include BCPharmanet which collates data on all filled prescriptions; Population

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What to get your dog . . .



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and other holiday insights from UBC experts

BY SEAN SULLIVAN

As the holiday season approaches, we asked four UBC experts for their advice on gift-giving, having a sustainable Christmas and how to beat the winter blahs.

A DOG'S CHRISTMAS

For many, Christmas gift-giving extends beyond the human members of the family. What, if anything, should you get your dog: an old-fashioned bone, or a rhinestone-studded designer collar?

Stanley Coren, a UBC professor of psychology and world-renowned expert on man's best friend, says dogs understand gifts in two ways: the pleasure of the social attention they receive during the ritual, and the gift, if it brings them pleasure.

Coren, author of *How Dogs Think: Understanding the Canine Mind*, suggests that pleasing dogs is a no-brainer. His research has found a dog's mind is roughly equivalent to that of a two or two-and-a-half year old human, and indicates that Fido may not care whether or not she gets the latest in doggy fashion.

"Anything pleasurable that we give them – even just a dog biscuit in the morning – might have the same status in their minds as that 'special gift' that we

give them for Christmas," he says.

The best gifts for most dogs are things that are edible, in part so the dog can make its own fun during holiday celebrations (and not interrupt the rest of the proceedings), he says.

The dog won't feel left out if it doesn't get a present, as long as it's not the only one. "If other dogs in the room are getting gifts and they are not, they are apt to get annoyed and respond negatively," Coren says.

GIFT-GIVING AND HAPPINESS

UBC researcher Lara Aknin studies happiness and spending choices. Her previous work led to a 2008 paper co-authored with UBC psychology professor Elizabeth Dunn that found individuals reported significantly greater happiness if they spent money "pro-socially" – that is on gifts for others or charitable donations – rather than spending on themselves.

Aknin suggests that gift-giving may have played an important evolutionary role. "Giving gifts may increase our happiness by facilitating and strengthening our social ties," she says.

"I don't know what makes for a 'perfect gift,' but a gift that would make the gift-giver happier should involve spending time with the recipient."

SHORTER DAYS MAKE US SAD

The holiday season also brings the shortest days of the year, with just eight hours of daylight as the winter solstice rolls around. The dark days are a prime cause of seasonal affective disorder (SAD), also known as winter depression.

Dr. Raymond Lam, professor of psychiatry and head of the Division of Clinical Neuroscience at UBC, says studies show between two and three per cent of the general population has SAD. Another 10 to 15 per cent gets the "winter blahs," troublesome symptoms that are not severe enough to warrant a diagnosis of clinical depression.

People with significant symptoms of winter depression (i.e., low mood, fatigue, oversleeping, overeating, concentration problems) should be checked out by their family doctor and/or a mental health professional, Lam says.

"People with milder symptoms of winter blahs can often feel better by staying active and spending more time outdoors during the winter, maybe by incorporating an outdoor walk into their daily schedule," he says.

Light therapy is also helpful for people with SAD, and can also improve symptoms of winter blahs.

NATURAL VS. ARTIFICIAL TREES

What's better for the environment: a natural or artificial Christmas tree?

John Robinson, professor in the Institute for Resources, Environment and Sustainability, suggests there's no clear-cut answer.


"It depends on where you get the real tree and how you dispose of it, or how long you keep the artificial tree," he says.

Stefan Storey, a researcher who works with Robinson, points to a Quebec study that considered artificial versus natural trees.

"It's a close call, but if you keep your artificial tree for only six years of use, a natural tree comes out as a winner in terms of CO₂ production (eight kilograms versus 3.1 kg)," he says.

However, the study authors make it very clear that this is a small impact compared to the impacts of owning and running a car.

"If your annual journey to pick up the natural tree involves a drive that's about 16 kilometres or more, the artificial tree starts to fare well," Storey says.

Robinson recommends *Granville* magazine and the David Suzuki Foundation's website as an excellent source of information on sustainable products and services that can be used to choose more sustainable presents. 

Watch for a special *UBC and the Games* edition of UBC Reports in January.

The issue will feature UBC research that is helping improve athletes' performances, UBC's participation in the torch relay, what the UBC community is learning from the Olympics . . . and more.

Information for the university community about UBC and the Games:

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