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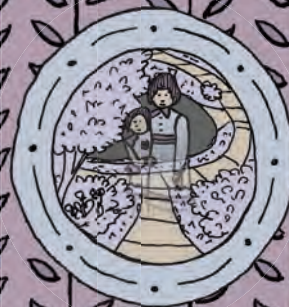
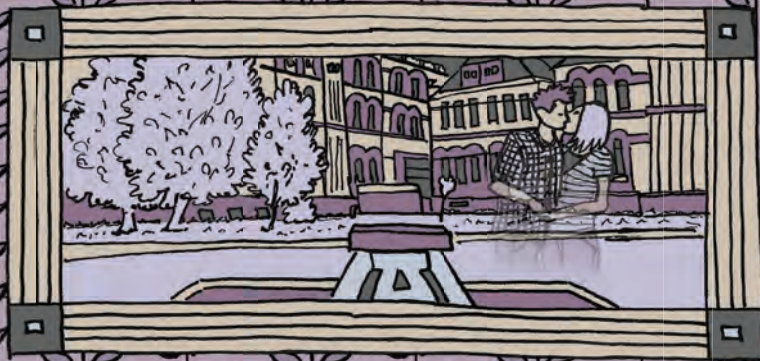
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Utah Science



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Volume 68 Issue 1 Spring/Summer 2014

UtahState
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I hope this issue of Utah Science is a welcome resource to help keep up-to-date with the research that is ongoing through the Utah Agriculture Experiment Station (UAES). This issue highlights a very diverse group of projects that illustrate the complexity of the research portfolio within the experiment station.

Research related to the Cache Study on Memory in Aging is aimed at understanding and battling a growing public health crisis. Part of this story focuses on current research examining journals of participants in the study and assessing how people who did and did not develop Alzheimer’s disease reacted to traumatic life events.

Farm safety researchers are working to improve instruction and safety for high school age youth on farms and encouraging young people to be involved in agriculture. Their research is also behind a recently published paper on hand wounds among farm workers related to worker and food safety. This work draws attention to the dangerous nature of farm work and need to be aware of dangers, especially among those most frequently injured — teens and the elderly.

The psychology of personal finance is a multistate project that applies behavioral psychology to emotionally charged questions about why some people save money and others do not. Their findings will help shape financial education and may help create smarter solutions to money concerns.

Daycare quality for infants and toddlers is a very important issue, especially in rural Utah where care options are more limited. Researchers are evaluating a program designed to improve daycare quality in rural and urban areas. There are thousands of little reasons that daycare quality in Utah matters, and not just for people who currently need daycare services.

These are all very different stories, tied together by UAES support of research that goes beyond what most people expect, beyond the cows and plows. The bottom line is that everything our researchers study whether it’s plant breeding, water conservation, cell biology, forestry, animal nutrition, food safety, economics...is all aimed at helping make people’s lives better. That is a big motivator. The experiment station has farms that people see. But the UAES is not a place, it is people; researchers, farm managers, student researchers, technicians all

invested in work that makes a difference in the lives of the people we serve.



Photo: Gary Neuenswander

Ken White
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Utah Agricultural
Experiment Station

Utah Science

Volume 68 Issue 1 Spring/Summer 2014

2 Growing Risk for Alzheimer's

Alzheimer's disease is more than just forgetfulness. It robs people of their abilities to think, remember, reason and control their behavior. A combination of genetic and environmental factors contributes to the disease's development, but the process may begin decades before symptoms appear. Researchers are working to discover what those factors might be and how people might decrease their risk of developing the disease.

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Each day thousands of children in Utah spend part of their day in the care of someone other than their parents. The quality of daycare affects so many families that it impacts communities now and well into the future.

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UtahState
University

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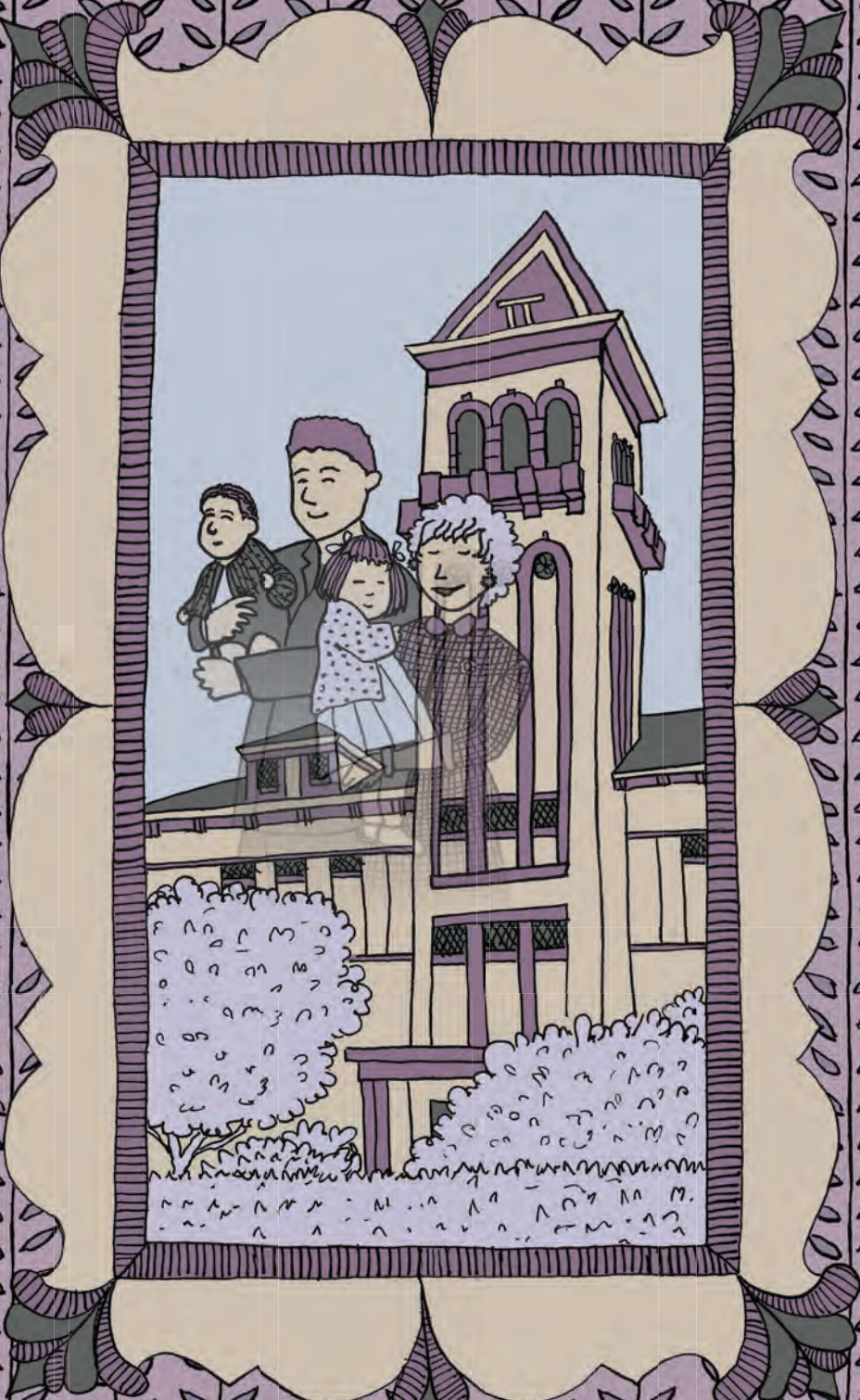
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GROWING RISK FOR ALZHEIMER'S

The list of illnesses that become more common in old age is familiar: heart disease, type 2 diabetes, cancer, Alzheimer's disease. Medical treatments can alleviate symptoms, arrest or sometimes cure some of these diseases, but there are no known treatments and no cure for Alzheimer's disease. More distressing still is that while treatments for other illnesses may slow you down or cause side effects, you are still "you" with cancer, "you" with diabetes, "you" with heart disease. Not with Alzheimer's.

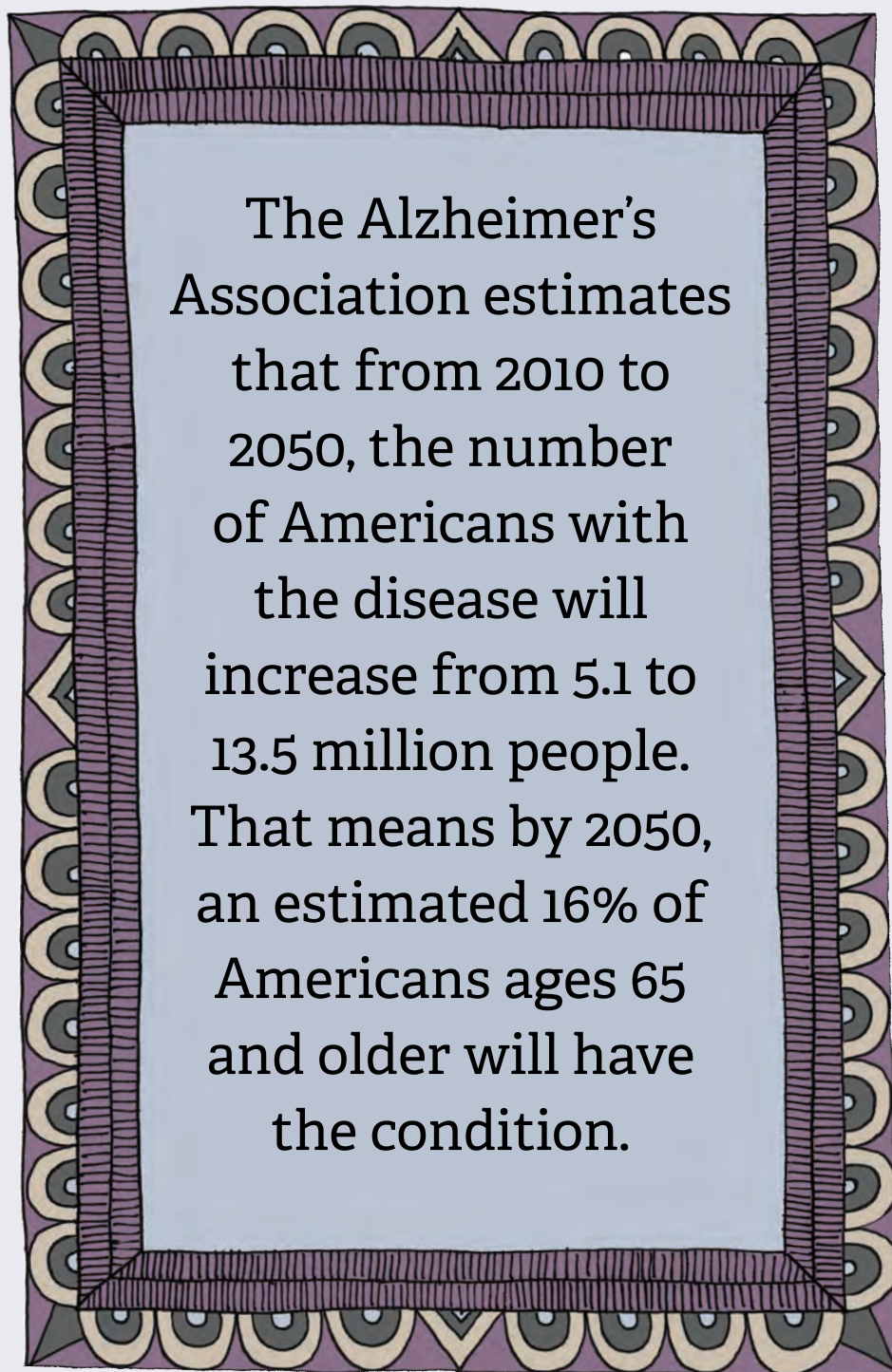
Alzheimer's disease (AD) is more than just forgetfulness. It robs people of their abilities to think, remember, reason and control their behavior. It is disorienting and frightening to watch and to experience, and the number of people with AD is on the rise. The Alzheimer's Association estimates that from 2010 to 2050, the number of Americans with AD will increase from 5.1 to 13.5 million people. That means by 2050, an estimated 16% of Americans ages 65 and older will have the condition.

From 1995 to 2011, researchers at Utah State University, Duke University, and The Johns Hopkins University collaborated on a large and complex project called the Cache County Study on Memory in Aging (CCSMA). At the start they enrolled 5,092 residents of Cache County, Utah, who were age 65 or older (90% participation rate). Over the course of the study, researchers periodically gathered data on many aspects of the participants' lives, including diet, lifestyle, family and personal medical history, emotional well-being, relationships with others, cognitive ability and others. It has produced a trove of statistical treasure that is helping researchers understand the disease in new ways just as the generous and trusting group of participants hoped it would.

Maria Norton, professor in USU's Department of Family, Consumer and Human Development, was involved in the study from the start, and is among the researchers using the CCSMA data to try to better understand AD and help develop ways to prevent it. It's an especially compelling topic for researchers at USU because projections predict the Western U.S. will have the biggest increases in numbers of people with AD in the next few decades, and that Utah will top that list because the state's residents generally live longer than people in neighboring states.

Some things about the disease are known, including that a combination of genetic and environmental factors contributes to its development. But research suggests that the neurodegenerative process may begin decades before symptoms of the disease emerge.

"Some Alzheimer's risks we can control and some we can't," Norton said. "Advanced age, genes and family history are not modifiable. But there is a much longer list of things you can control to a great extent that also modify your risk."



Among things on the "modifiable" list are education level, management of psychological stress, nutrition, smoking, exercise, chemical exposures, medications and head injuries. And while there are many variables in each item on that list, researchers are working to discover more about how some behaviors might at least delay onset of AD. Norton pointed out that delaying onset of the disease by just 5 years on average will cut in half the number of people who live with Alzheimer's.

Norton is interested in the full scope of research on the disease, but is specifically focused on trying to understand the role that

stress plays in the lives of people who develop AD and its impact on the people who care for them. While AD is always marked by a progressive failure of cognitive ability, there is wide variability in the rate of decline among people with the disease. Other studies of the aging brain have made a case for slowing cognitive decline that often accompanies aging by keeping the brain active with ongoing activities like reading, working word and number puzzles, traveling or playing card games. The evidence is especially strong, Norton said, for doing things that push the brain to learn something new. For example, playing



a musical instrument is good for the brain, but if you've played the same instrument for many years and make a switch to learning a new instrument the benefit is much greater because the novelty causes you to think and move in new ways.

The finding that continued learning and challenging the brain helps memory and thinking skills is related to work Norton collaborated on with an interdisciplinary team of researchers led by JoAnn Tschanz, professor in the Department of Psychology at USU, called the Dementia Progression Study. As part of the study, 187 participants who had been diagnosed with AD were assessed semiannually along with their caregivers. The researchers found that a caregiver and patient's relationship, how caregivers manage stress and whether a patient is engaged in activities, all play a role in how quickly a patient's cognitive function declines. Norton explained that when people have a close relationship with a caregiver who is extroverted, not anxious, and who engages them

ALZHEIMER'S BY THE NUMBERS

(Statistics from the Alzheimer's Association)



Someone develops AD in America every **67 Seconds**.

Two-thirds of people with Alzheimer's disease are **women**.



- In the United States Alzheimer's is the **sixth most common cause of death**, killing more people than breast and prostate cancer combined.
1. Heart Disease
 2. All Cancers
 3. Chronic Respiratory Disease
 4. Stroke
 5. Unintentional Injury
 6. Alzheimer's Disease

In 2014, the direct cost of caring for people with AD will be an estimated \$214 billion, including \$150 billion from Medicare and Medicaid. That does not account for the **17.7 billion hours of unpaid care provided by family and friends**,

valued at \$220.2 billion this year alone.



Nearly **one in every five dollars** spent by Medicare is for people with AD or other dementias.

More than 5 million Americans are living with Alzheimer's disease and similar dementias. 28,000 people in Utah in 2014 and projections for the state are that **by 2025 there will be 42,000**.



in activities, the patients showed a slower rate of cognitive decline.

“Our data showed it was measurable,” Norton said. “If a caregiver makes an effort to engage a patient in cognitively stimulating activities, all other things being equal like age and level of dementia, those people declined more slowly.”

Norton continues to investigate the role that psychological stress plays in AD. One study found that certain stressful life events are linked to a higher risk of developing AD. The goal, she said, is to someday identify people who could be considered more vulnerable to the disease because of these life events, especially those already at higher risk due to genetics or prolonged high levels of stress. Those people could benefit from more education and coaching to encourage behaviors that mitigate their high risk, especially because the helpful behaviors — including exercise, good nutrition, not smoking and managing stress in healthy ways — should start long before any symptoms appear. Among life events the researchers identified as increasing a person’s risk for AD were the death of a parent early in a person’s life, widowhood and the death of a child.

“What’s really fascinating is not just the link between widowhood or early parental death or any number of stressors, it’s the modifying variables,” Norton said. “In other words, not everyone who experienced a particular stressor is going to get Alzheimer’s disease. But who is? What other things combined to put them at higher risk?”

The data showed that people overall have double the risk for AD if they lose a parent early in life, and much higher if they lose both parents. But in cases where a parent remarried while a child was still growing up, the effect on the child’s later AD risk disappeared. Another paper published from CCSMA data found that death of a child was related to more rapid cognitive decline. However, if parents were still in their childbearing years and later had another child, there was no association with more rapid decline later in life.

“Somehow life went on for them, in a different way,” Norton said. “The effect appears to only be present in those who lose a child to death and then don’t take the risk of that kind of heartache again by having another child.”

As all scientists know, a study may result in new information and published results, but every study inevitably leads to more questions to explore. It’s no different for Norton. For example, research has shown that people who are more socially connected to others appear to have slower cognitive decline. But is it different for men than for women? It’s a fact that 2/3 of people with AD are women. Granted, women generally live longer than men, but the gender difference leaves Norton wondering further about how stress in relationships affects AD risk. Women generally socialize more than men and make closer personal connections, which should be protective. But they also tend to internalize more emotions and to take on other’s problems and try to make things harmonious.

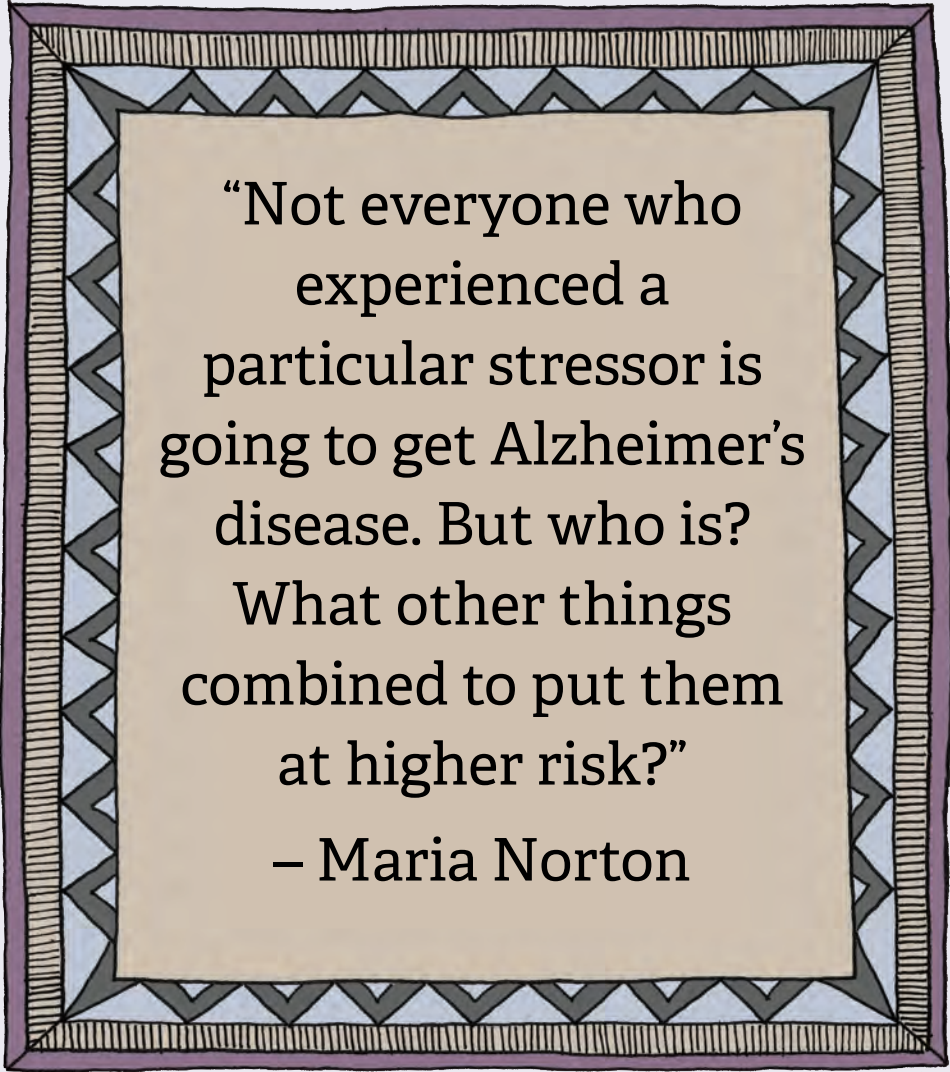
There also appear to be links between depression and AD. Norton said sometimes people think an older person is developing AD or another dementia when depression is the real

root of a cognition problem. But people who have had bouts of depression earlier in life are at higher risk for AD later. Norton wonders if depression earlier in life will have different effects on people who are currently at mid-life than it did on their parents because depression is more widely diagnosed and treated and people with depression generally have more social support now than they did a generation ago.

“Humans are so complex,” Norton said. “It would be easier to study the *Artemisia tridentata* plant and find out exactly how much water it needs to produce X number of leaves. But this work on human mental and cognitive health, with all its complexity, is much more fun and interesting to me.” – LH

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“Not everyone who experienced a particular stressor is going to get Alzheimer’s disease. But who is? What other things combined to put them at higher risk?”
– Maria Norton

PAST TENSE: Writing May Hold Clues to Health

Understanding the effect that people's reactions to stressful situations may have on their risk for developing Alzheimer's disease (AD) is a potentially important step in being able to delay the onset of AD.

"We know that two people can have the same kind of stressful life experiences and one gets Alzheimer's and the other doesn't," said Maria Norton, professor in the USU Department of Family, Consumer and Human Development. "It's subjective stress, meaning one person has an experience and says, in effect, 'This is a challenge, really ugly and difficult, but there is all this good stuff in my life that outweighs it,' they are better off than people who don't react that way and who dwell on the negative experience."

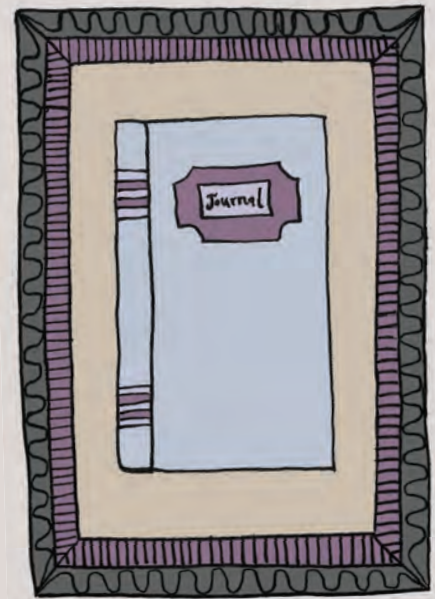
But how do you evaluate how someone reacted to a stressful life experience that happened 20, 30, 40 even 50 years ago? Is it possible to know how an individual was feeling, thinking and dealing with their stressors when they happened and long after? There are problems in how people recall and report their life's events. This "recall bias" happens for many reasons. People may feel shame about something that happened in their past. Greater perspective on an event may cause people to play down or even forget the gravity they felt when it happened. With no time to waste waiting for a time machine to be invented, Norton is taking a different approach to examining people's pasts.

With Utah Agricultural Experiment Station support for a pilot study, Norton is analyzing the journals and letters of 80 people who participated in the Cache County Study on Memory in Aging (See accompanying story for a brief description of the study). The research was inspired by a longitudinal study on AD and aging known as The Nun Study, founded by David Snowdon, a now retired epidemiologist and neurobiologist formerly at the University of Kentucky. Snowdon's research focused on 687 Roman Catholic sisters who are all members of the same religious institute, and therefore had lived very similar lives as adults. That lifestyle reduced or eliminated the effects of many important variables of aging such as diet,

housing, reproductive history, drug or alcohol use. Among the many facets of the study, Snowdon examined personal writing the nuns had done, particularly the autobiographical essays they wrote at the time they became nuns, typically at age 22. He found that the essays' "linguistic density" meaning fluency, energy and complexity of thoughts and sentence structure, significantly predicted who would develop Alzheimer's disease later in life and who would not. Of the nuns whose writing did not show high linguistic density, about 80% developed Alzheimer's disease. Among those whose essays ranked higher for linguistic density, just 10% later developed the disease.

Norton contacted Snowdon directly to discuss an idea she had about examining the writing of participants in the CCSMA. Of the 5,092 participants in the original Cache County study, 647 people were diagnosed with AD during the study and researchers can easily identify that same number of "cognitively intact" participants, match them by gender, birth year and other factors and compare their writings to see if the connection between linguistic density and AD holds true.

Thus far, Norton and her assistants have identified people in the study who did and did not develop AD and contacted their families to see if their loved one kept a journal. (Note: The study's participants and their spouses are nearly all deceased.) If so, researchers explained their research objectives and got permission to photograph and analyze the journals. Their success in obtaining the journals of 80 participants was helped by three factors, Norton said. One, when they were living, the participants were very generous with information about all aspects of their lives and researchers have carefully protected their identities and information. Two, study participants were vocal about their hopes that the research would benefit their children and grandchildren who now have the journals. Third, the majority of people in the study were members of the Church of Jesus Christ of Latter-day Saints which encourages its members to keep journals, especially when serving as missionaries, which people typically do in their early 20s. Many in this study were



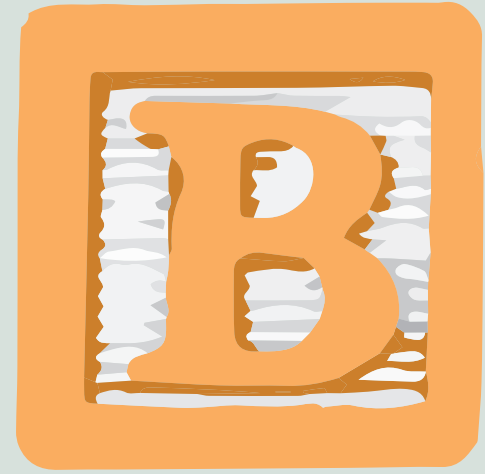
also in the military during WWII and other conflicts and kept journals and letters.

Norton acknowledges there may be personality biases because of the kind of person who chooses to keep a journal. State-of-the-art language analysis software is being used to examine samples of the transcribed journals. It looks at every word, with help from a dictionary the researchers built to include words with special local, cultural significance. The software will provide a count of all words, and study them for percentages of specific sorts of words; those describing mood, social connections, profanity, religious terms, those related to the physical body, etc.

"It's not so much the phrases or ideas they write about that are telling, but the nature of the linguistics," Norton said. "For example, if you're always writing in first person and using words like 'I,' 'me,' 'mine,' more than you write about other people or relationships, there are several papers from other studies using this methodology that show a prevalence of internally focused words correlates to higher rates of depression."

Norton hopes to discover whether they can confirm the findings of The Nun Study in a statistically sound way that would support an effort to try to expand their study to other, larger populations. If writing does turn out to be a predictor of AD risk it could aid efforts to identify people at higher risk, especially those whose family history puts them at greater risk, and provide enhanced education and coaching that encourages them to adopt behaviors that can at least delay or slow the effects of Alzheimer's disease. – LH

MEASURING QUALITY IN



Finding and choosing care for children, especially a charged decision for parents, but good daycare



number of longitudinal studies that tracked children over many years have found that those who experienced high-quality daycare as infants and toddlers had the greatest cognitive and language gains by age 4, and by age 15 children demonstrated higher cognitive and academic functions; even when researchers

took into account family characteristics like income, single parenthood, and other factors.

Each day thousands of children in Utah spend part of their day in the care of someone other than a parent, either in a home/family daycare or at a care center. Estimates in 2012, based on data from the U.S. Census, were that 153,598 Utah children under age 6

potentially needed child care because either their single parent or both parents were in the labor force. That is a lot of future adults being cared for in ways that will help or hinder their development.

Because child care quality affects so many families and therefore entire communities, Ann Austin, professor of child development,



pecially infants and toddlers, is an emotionally care is more than just a family matter.

and several graduate students have studied different facets of daycare and its connections to traits such as school readiness. Research supported by the Utah Agricultural Experiment Station has focused on different aspects of child care in rural and urban areas.

There are many factors parents consider when choosing a child care provider, wheth-

er they are evaluating home daycares or care centers. Physical surroundings and supplies, staff credentials, location, price and the ratio of children to adults are all mostly measurable, but there are also less concrete factors, including caregivers' personalities, whether children seem happy and engaged with adults; just the "vibe" of the place and people there.

Not surprisingly, child care options for parents living in non-urban areas are more limited than for their urban counterparts and the quality of care varies widely no matter where people live. Austin and graduate student Meagan Lokteff studied a state-run program called Baby Steps to explore whether the training and grants the program provides improve the



Photo: Ethan Neuenswander

Austin and graduate student Meagan Lokteff studied a state-run program called



to explore whether the training and grants the program provides improve the quality of daycare for infants and toddlers and compared outcomes in rural and urban areas.

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Baby Steps was initiated in 2003 by the Utah Department of Workforce Services Office of Child Care as a way to improve quality and increase the number of available spots for infants and toddlers in centers and with home daycare providers. The program provides 40 hours of training and reimburses care givers or centers for the time teachers spend in the training classes. Participants learn about child development and how it shapes the kind of care and play babies need, behavior manage-

ment, health and safety for children and adults, children's nutrition and other important topics. They are also eligible for grants to buy furniture, toys, books and play equipment. Specialists also work with caregivers and participating centers are evaluated at the start and periodically thereafter using the Infant/Toddler Environment Rating Scale-Revised (ITERS-R), which provides a concrete measure of many aspects of child care.

ITERS-R is used internationally and includes markers of quality grouped into seven areas. For example, when assessing space and fur-

nishings, specialists are checking whether there is adequate space, how big the furniture is relative to the children and how it is arranged. The activities category measures things like whether toys, books, sensory tables and dramatic play supplies are available and appropriate and how much TV and videos are used. ITERS-R also includes the ways in which teachers interact with the children and with parents.

Austin and Lokteff found that taken as a whole, ITERS-R scores for the entire group of participants did not show significant improve-

ment from the beginning, baseline assessments to those done during and after participation in Baby Steps — but that does not tell the whole story.

Analysis of subscale scores found significant increases in quality for space and furnishings, activities and interaction between children and caregivers. They also found that classrooms with the lowest initial scores made the greatest improvements.

“The greatest strides were made by those with the lowest scores to begin with,” Lokteff said. “It’s tougher to move higher on the scale if you started in the top quarter or third of the scores. Just getting into the middle range shows big improvements from the lower quality, and maintaining a better, higher level is easier once they make the initial big jump.”

One teacher reported that when she started working the center where she was employed had two cribs, one shelf with toys, and a changing table. After Baby Steps training for the staff and access to grant money they had eight good cribs and 10 themed learning centers with great materials specifically for infants and toddlers.

Only reaching middle range in the ITERS-R is still good news for children though, as other studies have found even that level of quality has long-term, positive impacts on their cognitive development.

They found that rural programs made the biggest gains in quality after participating in Baby Steps, which fits with Austin’s earlier findings that rural areas generally have lower quality child care options.

“We also found that parents in rural areas had different expectations for care than parents in urban areas,” Austin said. “It was like they just thought low quality was as good as they were going to find and they sort of settled for it. Rural parents also seem to have less time to interact with care providers. We didn’t investigate the reasons for that so I don’t know if it’s that they are traveling farther each day from work to the care center or working one job and then going home to a farm that needs more of their time.”

The tendency to settle for lower quality care also affects caregivers. Lokteff said one

THE INFANT / TODDLER ENVIRONMENTAL RATING SCALE (ITERS) was designed to assess programs for children from birth to 30 months of age, the most vulnerable of all age groups, and who require the most personal attention. ITERS was developed using research from the fields of healthcare, child development and education, professional views of best practices and the realities of life in a child care setting. The scale is used internationally.



SPACE and FURNISHINGS

Indoor and outdoor spaces, child-sized furniture, provision for comfort, furniture arrangement that allows supervision from anywhere in the room.



PERSONAL CARE ROUTINES

Greeting and departing, meals including hand washing and surface sanitizing, lots of hand washing (children’s and teachers’) with specific activities, diapering or toileting.



LISTENING and TALKING

Use of descriptive words, verbal play, encouraging language use, books (content, number, condition, ways they are used).



ACTIVITIES

Fine motor skills, active play, music and movement, blocks, dramatic play, nature, sand and water play, use of TV/computer/video, encouraging accepting diversity (picture books, toys, reflect diverse people.)



INTERACTION

Supervision, peer interaction, staff-child interaction, discipline practices.



PROGRAM STRUCTURE

Predictable schedule, provisions for disabilities, free play, group play.



PARENTS and STAFF

Provisions for parents, personal needs of staff, professional needs of staff, staff interaction and cooperation, staff continuity, opportunities for professional growth.

QUALITY

The biggest indicator of **QUALITY** is whether children are engaged with adults and with activities, not just sitting passively. Austin said there should be a “happy level” of noise and mess that indicates children are playing and learning.

center director said that consumers aren't very aware of what good quality infant and toddler care should be. The director reported that she operates the only licensed care center in her area and therefore charges slightly more than some other providers. Licensing by the state is in place to monitor health and safety measures, but does not address other aspects of care, Lokteff said.

“In rural areas especially, licensed care givers are not charging much more,” Lokteff said. “But because they do, people tend to choose non-licensed, non-regulated care or family members and friends. That makes it harder for rural providers to invest in materials and people.”

It's interesting too, Austin noted, that in Salt Lake City there are several accredited day-

care providers and they charge more because gaining accreditation is much more demanding than just being licensed. It works there because parents are willing to pay more for a higher standard of care.

High rates of teacher turnover make it more difficult for centers to attain higher ITERS-R scores. The study found that having at least one trained teacher in the room was consistent

NUMBER

OF CHILDREN IN DAYCARE

(Statistics from the U.S. Census)

16% of babies under age 1 are in center-based care.

26% of 1- and 2-year-olds are in center-based care.

Add children enrolled in family day care (in someone's home), and **33%** of children under age 5 are regularly cared for by nonrelatives.

18% of children under age 5 have a mix of care provided by relatives and other programs.

153,598 of children under age 6 in Utah need daycare (either their single parent or both parents are in the labor force).

with achieving higher ITERS-R scores. Training measurably improves the quality of care, but if people leave to take other jobs before their skills are more developed and centers must hire replacement teachers, the impact of that training is lost. Something Lokteff did not expect were the difference in what ITERS-R measures and the things center directors identified as indicators of high quality care.

“Directors used words like nurturing, caring, team player and willing to work hard when they described ‘high quality’ care,” Lokteff said. “They use very personal characteristics. Those qualities are all important, but less teachable skills. A couple of people said teachers must be able to lift heavy loads, bend and pick things up and work hard at a fairly monotonous day.”

Austin found rural caregivers, whether working as teachers in centers or in their own homes, were more receptive to receiving training and having access to resources for materials and other improvements than were their urban counterparts. However, at the other end of the spectrum several, mostly rural, care pro-

viders said they would not participate in Baby Steps and were hostile toward the state’s overall Care About Childcare program because it is government-sponsored. Care About Childcare maintains a website that helps parents find licensed care providers in their area, but much of the information there depends on a care giver’s willingness to contribute information about their facility, philosophy and training credentials (CareAboutChildcare.utah.gov).

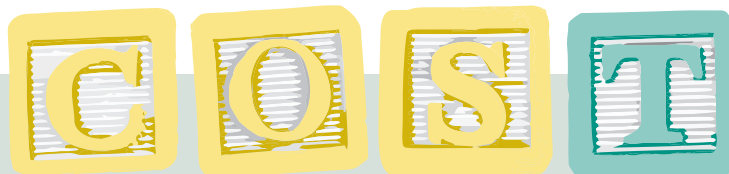
In addition to evaluating factors included in ITERS-R (see accompanying story), Austin and Lokteff recommend some other things for parents to look for when they seek care for their infants and toddlers. Lokteff, who has worked in child care for several years and been a teacher of infants and toddlers, said the biggest indicator of quality is whether children are engaged with adults and with activities, not just sitting passively. Austin said there should be a “happy level” of noise and mess that indicates children are playing and learning. Parents should also ask about specific policies and practices: What if a child or teacher is ill? How

do teachers respond to behavior problems? Is there a schedule and what do infants and toddlers do during the day? Where do children nap and how does that fit in the day?

Lokteff said reviewing items on ITERS-R gives parents specific things to watch for when they are looking for a daycare provider, but much of the final decision is also based on the parents’ opinions. “I’ve had people come in and see the small furniture, activity centers and toys and say, ‘I didn’t know it could be like this.’ But I could recommend places to two families and they would each choose a different one for different reasons, just because of how they felt about it,” she said. – LH

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OF DAYCARE IN UTAH

(Statistics from the Child Care Aware of America)

2012 average annual cost of infant care in Utah:

Day care center: **\$7,860**

Family day care: **\$5,748**

Cost of child care as percentage of median income in Utah for a single mother: **29.5%**

Cost of child care as percentage of median income in Utah for a couple: **11.1%**





OVERCOMING PIGHEADED MONEY HABITS

— \$ —

Some things related to money are very individual. How much people earn, their money attitudes and habits, how much they spend, all vary widely. But there is one statement about money that is as close to universally true as you are ever likely to find:

Americans don't save enough.

Currently, Americans save 5.8% of their income, on average. Compare that with people in countries that top the list for saving and their averages ranging from 9 to 20%. Jean Lown, professor in USU's Department of Family, Consumer and Human Development has taught and studied personal finance for 35 years and is convinced that the key to getting people to save more is to understand what motivates them. What makes some people savers? And if your answer to that question was "They earn more," you're wrong. Not entirely wrong, but many other factors are at play in decisions about money.

The economy may shift wildly, but in the years Lown has taught people about personal

finance, most of the basics haven't changed. People need to spend less than they earn, build emergency savings, create a spending plan (otherwise known as the dreaded "budget"), buy appropriate amounts of insurance, save for retirement.

"We've been teaching and preaching it for decades, but people don't do what they know they are supposed to do," Lown said. "The field of behavioral financial psychology developed about 15 years ago and recognized that people aren't rational, they are emotional and they often do things that are against their own self-interest. I think the future of financial education is in understanding the psychology of saving and spending."



Photo: Ethan Neuenswander

“The field of behavioral financial psychology developed about 15 years ago and recognized that

PEOPLE AREN'T RATIONAL,

they are emotional and they often do things that are against their own self-interest. I think the future of financial education is in understanding the psychology of saving and spending.” – Jean Lown

To that end, Lown and colleagues at more than a dozen universities nationwide are working to understand the factors that add up to decisions about money, with a focus on low-to-moderate-income individuals and families. In one study, the researchers found that while higher income, net worth and education level were positively related to the likelihood of having savings and investment accounts, the significant factors linked to whether survey participants had savings accounts were age and financial behaviors. Among the psychological factors they examined were impulsivity, materialism and perceived subjective norms.

It's not a surprise that impulsiveness is an enemy to saving. The researchers also found that people with greater self-control and the ability to delay gratification are more tolerant to financial risk and more likely to save and invest.

The other three factors mentioned above are somewhat related to one another. Previous studies have found that family structure

influences how much someone values material things, which may help explain differences in saving behavior. A perceived subjective norm is an individual's perception of whether people who are important to them would approve or disapprove of their behavior. Lown said though the collaborators' research did not specifically aim for data about family culture, colleagues in areas with low income populations, and in very rural areas, noted that if living paycheck to paycheck is the norm it's difficult to think or behave differently or to set longer term financial goals.

Age was a significant factor in saving behavior as the likelihood that someone had at least one saving account increased with age by 2.4% per year. That seems logical, but there was no significant link between gross income or net worth and having a savings account.

One significant finding of the study was that people with more sources of information about personal finance were more likely to have savings accounts. Specifically, for each source of information participants in the sur-

vey used, they were 24% more likely to have a savings account. That bolsters Lown's belief that it's important to develop multiple messages and different techniques to teach people and shape their financial behaviors.

In her years of teaching and research and her experiences spearheading the free, Financial Planning for Women workshop series (www.usu.edu/fpw) at Utah State University since 1997, Lown has learned that a message that motivates one person to take action does not work for everyone. For example, when teaching groups of women about retirement, Lown shares statistics about how important it is for women to be aggressive about retirement saving and investing because they tend to live longer than men and earn less during their years in the workforce or at home.

“If you are single, female and old your financial security is at risk unless you have done some good financial planning,” Lown said. “Hearing that message makes some people think, ‘I don't want to be a bag lady. I'd better do something about it now,’ and they

Having a certain percentage of your salary

AUTOMATICALLY DIVERTED

into a savings account is the best way to save, Lown said. You make the decision once, set up the account, and the money is sent there before there is a chance for some purchase to overcome your good intentions to make a deposit.



do. Other people hear the same message and just shut down. It paralyzes them. They may respond better to an approach like asking them what they imagine themselves doing in retirement. What does it look like? And then helping them make a plan to get from here to there. If you just use warnings you turn off half the group, and if you only talk about how wonderful retirement will be, some people are not motivated to action.”

Usually “action” is what’s required to successfully manage finances, but once a good course is set it’s inertia — the opposite of action — that can be more beneficial. Lown pointed out a few simple, but effective examples. It used to be that workers had to actively choose to contribute part of their salary to a 401(k) plan. More recently, many employers have turned that around and made contributing the default and workers must opt out of participating. Most people do the simplest thing and just go with the default. In a similar way, having a certain percentage of your salary automatically diverted into a savings account

is the best way to save, Lown said. You make the decision once, set up the account, and the money is sent there before there is a chance for some purchase to overcome your good intentions to make a deposit. Inertia is also on your side if you invest in a financial instrument like an Individual Retirement Account because your money grows while it’s left alone, but you suffer penalties if you withdraw the money too early.

Lown bristles over research that says people who have taken a financial education class don’t save any more than people who have not, and concludes that the classes don’t do any good. “How can you expect a one quarter or one semester class to overcome decades of socialization and a multi-million dollar advertising industry that exists to convince everyone that they need a lot of things and that it’s easy to have all of them right now?”

Lown stresses that it’s important for people to discuss finances with their children. It helps adults internalize and act on more of the things they learn and money shouldn’t be

a one-time conversation. “Study after study has shown that people in America spend more time every year planning their vacation than they do planning their retirement and reviewing their finances,” she said. “I know, you’re facing all the things that you have to do right now. You have kids to care for, and an evening meeting, and a piano recital, and soccer practice, and you think you don’t have time now and that you’ll get to it sometime. And someday you’ll do some estate planning and you’ll write or update your will because you’re not going to die this week or even next year. Those are the sorts of thing we are working against and we have to find the best ways to help people learn and take action.” – LH

➔ Contact Info:

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synthesis:

Congratulations to the faculty members who were recognized for their outstanding work during 2014 Research Week activities at Utah State University. Among those honored by USU's Office of Research and Graduate Studies were these researchers with Utah Agricultural Experiment Station projects.

By USU Office of Research and Graduate Studies
Communications Staff



Science at Utah State

College of Agriculture and Applied Sciences — Researcher of the Year, **Robert Gillies**

As director of the Utah Climate Center, Robert Gillies conducts his own research program and coordinates the efforts of a team of faculty and student researchers who are committed to understanding what drives climate in Utah and worldwide. Their goal is making climate data relevant to a wide range of users, including land and natural resource managers, people in industries such as agriculture, outdoor recreation and tourism. Under his leadership the center's databases have been made accessible online for citizens and scientists (<http://climate.usurf.usu.edu>). Gillies joined the faculty at Utah State University in 1996 with a joint appointment in the Department of Geography and Earth Resources and the Department of Plants, Soils and Climate.

He has authored or co-authored dozens of referred journal articles and reports and made presentations on Utah Climate Center research worldwide. His particular research interests include integrating climate and land surface processes to better understand Earth's changing environment, inversion prediction, precipitation cycles and global climate dynamics. The breadth of Gillies' research and related responsibilities means that he may be educating Utah policy makers about potential impacts of drought and climate change one day and flying to Nepal the next to work with a network of citizen scientists to track climate and its impacts on people's lives in that region.

Photo: Gary Neuenswander



S.J. & Jessie E. Quinney College of Natural Resources – Researcher of the Year, Karen Mock

Using genetic tools that have only been available in the past two decades, Karen Mock studies molecular ecology and conservation genetics. Specifically, she studies genetic diversity patterns in natural populations, and uses these patterns to make natural resource management recommendations. Her projects involve a broad array of species, including aspen, freshwater mussels, fish, frogs, bark beetles, and bears, with populations spanning continental scales. In western U.S. aspen,

she has discovered surprisingly high levels of genetic diversity, suggesting that reproduction by seed is more common than previously thought. This finding has a direct impact on the management and restoration of aspen in western forests. In freshwater mussels, suckers, and frogs, Mock and her students have discovered genetic patterns that contradict current taxonomic subdivisions, potentially leading genus-level taxonomic revisions and altered conservation strategies. In bark beetles, she and her

students and colleagues have been able to use gene flow patterns to track this important forest pest and document the expansion of its range with climate change. Mock also encourages undergraduate research in her laboratory, with students working on population genetics in coyotes, phragmites (an invasive reed), oaks, aspen, and bears.





College of Agriculture and Applied Sciences, Outstanding Undergraduate Research Mentor –

Bo Yang

In the three years since he joined the faculty of the Department of Landscape Architecture and Environmental Planning, Bo Yang has developed a reputation as a professor who regards students as colleagues. He is the first research fellow of the Landscape Architecture Foundation to involve undergraduate students in cutting-edge landscape performance research. He currently involves three undergradu-

ate students in a water quality monitoring study, and since 2011 has trained 12 other undergraduates. His main areas of interest are environmental planning and technology, stormwater management, community planning and design, landscape water policy, history and theory in China and East Asia. Yang's current research examines impacts of different community planning approaches on stormwater quality and the long-term

effectiveness of various low-impact development strategies. He also has expertise in GIS watershed modeling, spatial analysis and statistical analysis. In the past year he co-authored papers with his students and presented at academic conferences across the country. He is also vice president of Overseas Chinese Landscape Architects Association and a member of the International Association for China Planning.

Governor's Medal for Science and Technology Awarded to UAES Director

Utah Agricultural Experiment Station Director Ken White, was honored with a 2014 Governor's Medal for Science and Technology recognizing his history of promoting the development of science and technology.

White, who also serves as Utah State University's deans of the College of Agriculture and Applied Sciences and vice president for Extension, was selected to receive the award by the Utah Governor's Office of Economic Development and honored along with six other outstanding leaders in science and technology.

"I'm honored and humbled to receive the Governor's Medal for Science and Technology," White said. "This is an acknowledgement of a body of my work that also acknowledges several colleagues and students who have been instrumental participants in these achievements. Receiving this award is also a recognition of their contributions, not only mine."

White was awarded in the academia category for creating an internationally recognized research program, including work that culminated in the birth of the world's first equine

clones — three genetically identical mules born in 2003. The governor's award also honored White's work in establishing the USU School of Veterinary Medicine.



From left to right: State Science Advisor Carol George, UAES Director Ken White, Utah Governor Gary Herbert.

Photo: ©2014 Kent Miles

Economist Named to New Research Post

DeeVon Bailey, professor in the Department of Applied Economics, has been appointed the associate dean for research and will work closely with faculty members, research groups, departments and research centers to strengthen research activities in the Utah Agricultural Experiment Station (UAES), USU Extension and the College of Agriculture and Applied Sciences (CAAS).

"My goals will focus on enhancing opportunities now and into the future for CAAS, UAES and Extension faculty to preserve and expand outside funding opportunities and to publish their research findings," Bailey said.

Bailey has been a faculty member in CAAS for more than three decades and has experience conducting and administering research

projects and Extension programs. He previously served as USU's associate vice president for international research, responsible for developing research and technical opportunities for USU faculty and has experience doing research and program development in more than 30 countries. He has published a number of articles related to meat traceability in the Americas, Europe and Japan. Bailey has also published articles on work he did on small-scale agriculture, trade issues, cattle markets, food safety and food quality in South America and Africa.



DeeVon Bailey is the new associate dean for research.

Photo: Gary Neuenswander

New Research Farms Donated

The Utah Agricultural Experiment Station recently added two new farms to its group of properties that serve as outdoor laboratories and produce crops that support research projects.

A 30-acre property in Clarkston, Utah that has been a working farm operated by member of the same family for more than 100 years was donated by Scott and Michael Fuhrman and Carl Fonesbeck. The farm is named in honor of the donors' great-grandmother and will be called the Emily Godfrey Fonesbeck Research Farm. Among the most first research-related activities on the site will be the

Utah Climate Center's installation of a suite of climate and weather instruments. While other spots in Utah's Cache Valley are equipped with similar instruments, conditions are not monitored and recorded by any weather station in the northwest portion of the valley. Because the valley's geography creates numerous and widely variable microclimates, having data collected at the Clarkston site will be valuable to climate and plant scientists as well as local farmers.

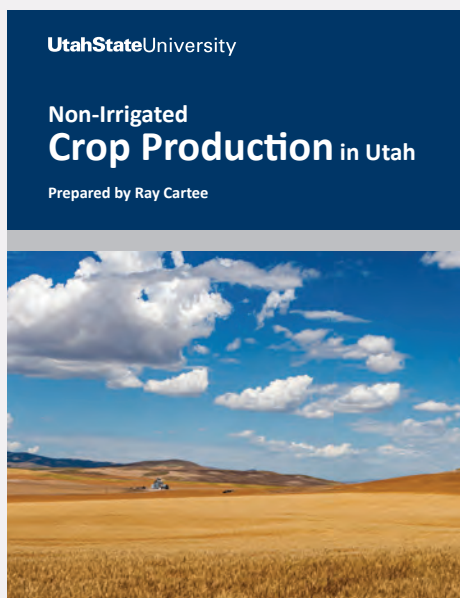
A second piece of property in Richmond, Utah will eventually add 320 acres to the existing Richmond Research Farm that is the site

of experiments on control of alfalfa weevil and other pests, in addition to grass variety trials and tillage research. The property was donated by Clarence and Joan Funk. Part of the agreement specifies that a portion of the property be used for rangeland research — a good fit with work already conducted by scientists from the USDA Poisonous Plant Laboratory on the Utah State University campus. In addition, 20 acres of the farm is an orchard planted by Clarence Funk's brother Reed. The fruit and nut trees will remain and be used in future research programs.

Site of the new Emily Godfrey Fonesbeck Research Farm in Clarkston, Utah.



Photo: Gary Neuenswander



Non-Irrigated Crop Research Published

A new research report — *Non-Irrigated Crop Production in Utah* — summarizes work done over a 10-year period at two Utah Agricultural Experiment Station (UAES) research farms by Ray Cartee, assistant professor in the Department of Plants, Soils and Climate and director of UAES research farms. The report provides data and recommendations about tillage and fertility treatments in wheat and safflower at the Nephi Dryland Re-

search Farm in central Utah and the Blue Creek Research Farm in the northwestern part of the state. In addition to the tillage and fertility data, the report covers research on methods of controlling snow mold in crops. Statistical and economic analysis was done by UAES Associate Director Donald Snyder, professor in the Department of Applied Economics. The report can be viewed online at <http://tinyurl.com/UAESReport219>.

CAUTION: FARMERS AT WORK



EVERY
DAY

MILLIONS OF PEOPLE

in the United States go to work in one of the top 10 most hazardous jobs so that they and others in this country and abroad can eat. People who don't raise crops or cattle, don't harvest fruits and vegetables by the ton or drive tractors, often imagine the agrarian life as idyllic scenes of animals grazing, lush plants bearing fruit and cowboys riding behind herds of dusty, but docile cattle.

There are spirit-lifting facets of working in agriculture, but it is a dangerous business. Tractors roll over and crush drivers. Clothing and then limbs become entangled in machinery. Animals kick or trample their handlers. Mold spores in dust from stored grain and hay are inhaled and cause dangerous inflammation that compromises lung function. Mishandled chemicals damage cells and cause injuries. Tasks that require hands-on cultivation and harvesting can cause back and hand injuries. Years of exposure to the sun causes skin cancer. Dangerous gases asphyxiate people who thought they were going to quickly fix a problem in a manure pit but are overcome and rapidly lose consciousness.

Michael Pate, assistant professor in USU's School of Applied Sciences, Technology and Education, is working to improve health and safety for people in agriculture. He knows understanding how people learn and put their knowledge into action is a crucial step in designing curriculum and determining how to deliver content. In Pate's case answering those questions can help prevent injuries and, in some cases, improve food safety. He is especially interested in the ways people think about their work. Not how they feel about it, but how they actually think through tasks: Why am I taking this step? Why do I do it this way? Are there other ways to do this?

"I have several research projects, but my focus all comes down to finding ways to help employees and employers in agriculture and help synergize some existing programs to improve worker safety," Pate said.

Youth have the highest risk of work-related injuries. Very old people are also at high risk, a problem that is becoming more pressing as the average age of farmers and ranchers climbs. According to the U.S. Census of Agriculture, in 1945 the average age of American farmers was 39. But by 2007, the average had climbed to age 58.

There is an abundance of research that says experience and the ability to do a task improves with experience. It makes sense that the more you do something the more skilled you become. Pate has seen this in classes he teaches, especially in trouble-shooting exercises, and found that students with more



experience have a broader repertoire of strategies to help them solve problems. But another psychological factor commonly comes into play and people become desensitized to the dangers around them.

“People become so accustomed to the work they are not as aware of things that can be dangerous,” Pate said. “Or people have the attitude that danger is just part of the work. Certainly nothing is completely risk free, but there are better ways to think about how we go to work.”

There are U.S. Department of Labor regulations aimed at improving farm workers’ safety and spell out specific tasks no one under age 16 should do, including operate a tractor over 20 horsepower, work with power takeoff generators (commonly known as PTOs), handle explosives or anhydrous ammonia, or work with intact male livestock. There are exemptions to some rules when young people work on their family’s farm, but even defining who is “family” when teens are hired has been a point of debate for policy makers and the industry Pate said.

There are also tools such as the USDA’s Good Agricultural Practices (GAP) program which includes audits of an extensive list of agricultural practices and certifies farms that comply. Participation in GAP is voluntary, but Pate said many large grocery chains and food processors, that have to keep consumers happy, have adopted policies and advertise that they only purchase goods from producers whose operations are certified. The bottom line for most farmers is that they must be

certified. Some see GAP and other regulations as government meddling. Pate said while doing research on risks of working in confined spaces like grain bins and stalls he received calls about “too much government regulation” in agriculture. His own view is that GAP and labor laws — especially those regulating labor practices for children — are in place to help solve problems.

“We can solve safety problems three different ways; regulation, engineering and education,” Pate said. “Each has its own strengths and weaknesses, but using all three I think lets us do the best for the most people.”

One of Pate’s research projects is focused on a program that supports agricultural employment and entrepreneurial experiences for high school students. Supervised agricultural experiences, or SAEs vary widely and may include working on a farm or ranch, keeping a flock of chickens and selling the eggs as a small business, or working in an agribusiness and learning management skills and record keeping. All are supervised by high school agricultural technology teachers. Pate and several colleagues are assessing the methods teachers use to keep students safe while they participate in SAEs, identifying best practices in supervision and safety instruction that can be shared with all agriculture teachers.

During the first year of the study, Pate and colleagues conducted interviews and reviewed questionnaires complet-

ed by agriculture teachers from across the country. Now the work of analyzing data has begun. The researchers are also determining ways to improve their recommendations by gathering more input from stakeholders including 4-H leaders, agribusiness and university professionals, and safety regulators. Pate is also interested in ways to use tools like web-based training to educate young people working in agriculture.

“Some people have the perspective that we should keep all kids off farms,” Pate said. “There is even some division in the ag safety community about how to approach this work. But I see the love people have of the agrarian lifestyle and rural living and we want kids out in the fresh air, learning to work. Without people in agriculture we’d all be in trouble. What I do is for them, helping them keep that lifestyle intact because I appreciate what they do every day...including every weekend and holiday.”

– LH

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“WE CAN SOLVE SAFETY PROBLEMS THREE DIFFERENT WAYS; REGULATION, ENGINEERING AND EDUCATION,” PATE SAID. “EACH HAS ITS OWN STRENGTHS AND WEAKNESSES, BUT USING ALL THREE I THINK LETS US DO THE BEST FOR THE MOST PEOPLE.” — MICHAEL PATE

SAFE FOOD STARTS AT THE FARM

Specialty crop production in the U.S. is a profitable niche for many farmers and it relies heavily on migrant and seasonal workers who hand-harvest fruits and vegetables. The people who do these jobs are at risk for injuries and their wellbeing at work is also part of the food safety equation.

The Farmworker Enumeration Study documented that Utah's migrant labor force grew from 8,983 in 1990 to 17,991 in 2000. Migrant workers are at higher than average risk for injuries on the job. In order to devise better training and protection and determine what dangers workers' hand injuries pose to food safety, Michael Pate, assistant professor in USU's School of Applied Sciences, Technology and Education (ASTE), and Brian Nummer, associate professor in the Department of Nutrition, Dietetics and Food Sciences and USU Extension food safety specialist, conducted a pilot study to assess the injuries workers most commonly get and the kinds of infection-causing bacteria that are present.

For the small study — which was published in the *Journal of Agricultural Health and Safety* — Pate and his research assistants surveyed and observed workers at six fruit operations in Utah; two that were Good Agricultural Practices (GAP) certified and four that were not. Workers reported their frequency of hand washing during the work day and their use of gloves. Their hands and wrists were examined for open wounds including cuts, abrasions, puncture wounds and fingernail injury or loss. The researchers also acquired bacteria cultures from workers hands that were analyzed for the presence of Salmonella, coliforms and

E. coli — because previous studies by other researchers found gastrointestinal illnesses caused by these bacteria are 20 times more common among migrant workers than among the urban poor. In addition, cultures were checked for *Staphylococcus aureus* because a specific strain of the bacteria is a common cause of infection that is resistant to antibiotics and requires extensive treatment.

At the GAP-certified farms, workers had access to mobile latrines with hand-washing stations that were stocked with soap and paper towels. Just one of the non-certified farms had a similar facility near the harvest site. At the non-certified farms, more than 80% of workers reported washing their hands once or not at all during the work day, whereas 100% reported washing two or more times during the work day on the certified farms.

One finding was a higher incidence of hand injuries on non-certified farms. Also, bacteria cultures showed that *E. coli*, coliforms and *S. aureus* were significantly more common on the hands of those workers. They did find more workers at one certified farm had Salmonella on their hands than did workers on the other farms.

Pate and Nummer caution that a larger study with more farms is needed. But they were confident in saying that because "worker payment is linked to quantity of produce harvested, the incentive for these workers to boost their productivity may come at the cost of faster and less careful work, increasing the risk of injury."

Pate said operations that hire migrant laborers provide training each season focused

on the tasks to be done and safety, and he notes there are challenges for farms of all sizes when it comes to supervising seasonal workers. Providing portable latrines and wash stations near harvest sites can be expensive for small farms that generate smaller profits. Large farms may have capitol to invest in that equipment, but the size of the workforce can make it difficult to monitor whether workers are following the hygiene protocols the farm has established. Pate and colleague Kelsey Hall, assistant professor in the ASTE department, are expanding the project and developing safety plans that translate to safer produce which they see as beneficial all around: workers are more protected from injuries and disease and farmers can include that information in their marketing messages to boost their produce sales. — LH



Characterizing the Face and Value of the “Buy Local” Movement

by Kynda Curtis

Associate Professor and Extension Agriculture and Food Marketing Specialist, Department of Applied Economics

The “buy local” movement was brought to the attention of the American public and perhaps fueled by popular literature such as *The Omnivore’s Dilemma: A Natural History of Four Meals*, *Fast Food Nation: The Dark Side of the All-American Meal* and *Slow Food Nation: Why Our Food Should be Good, Clean, and Fair* where traditional or “old world” food preparation and growing methods are praised and the processed food industry is blamed for the obesity epidemic.

The USDA has further driven attention to local foods through its “Know Your Farmer, Know Your Food” initiative, which focuses

The question is what exactly is a “locavore” and why might it be important to be one?

on assisting beginning farmers and ranchers in achieving economic sustainability through higher-value, direct-to-consumer sales. The “buy local” movement has a plethora of its own buzz words: locavore, farm-to-table, and foodie are just a few examples.

Locavore, per the Oxford Dictionary is “A person whose diet consists only or principally of locally grown or produced food.” No further description of the person, why they choose to buy local foods, nor the definition of “local,” is given. I have spent the last 12 years researching and educating agricultural producers on the type of people (the “face”) who purchase specialty or differentiated (local, organic, grass-fed, natural, etc.) foods, the rationale behind their purchases and their pricing expectations. Thus, I offer a few insights into the “buy local” movement.

What is the Economic Value of Local Food?

According to the 2007 USDA Census of Agriculture, direct-to-consumer food sales accounted for only .4% of total agricultural sales and involved just 5.5% of farms in

the U.S. But, the growth rate of direct food sales was twice that of total agricultural sales (105% vs. 48%) and increased three-fold from 1992 to 2007 (\$404 million to \$1.2 billion). Another source (2008 Agricultural Resource Management Survey) estimated local food sales to be much larger at \$4.8 billion in 2008 (or 1.6% of total agricultural sales), which included intermediate sales of local food to grocers, restaurants, institutions, and food service. Between 1992 and 2007, local food sales grew three times faster in the Far West and Rocky Mountain regions. Fresh fruits, vegetables, and nuts dominate local food sales, and thus, areas where growing conditions favor their production see strong sales. The value of local foods is highest in metropolitan areas, where farmers’ markets and farms are near a large urban population center. Overall, the value of local food sold is highest in the Northeast and the West.

Where is Local Food Offered?

Consumer demand for local foods is demonstrated by the extreme growth in the number of farmers’ markets around the country, which increased by 364% from



Photo: Gary Neuenswander

1994 to 2013. Additionally, the number of community supported agriculture programs (CSAs) has grown to over 6,000. While farmers' markets, CSAs, and farm stands are the traditional direct local food outlets, commercial channels, such as box stores, national and local grocery stores, and restaurants now carry local foods. The National Grocery Association 2012 Consumer Panel found that the availability of locally grown produce and other locally packaged foods were major influences on grocery shopping decisions as 87.8% of respondents rated local food availability as "very or somewhat important," with 45.9% indicating "very important." The need for "more locally grown foods" was the second most desired improvement among surveyed grocery shoppers at 36.6%, just under "price/cost savings."

Larger grocery chains, such as Walmart, Kroger, and Supervalu have incorporated local foods into their long-term strategies. Walmart plans to increase the share of locally grown produce to 9% in the U.S. and 30% in Canada by 2015 and Supervalu buys between 25 and 40% of its produce from local suppliers. However, consumer distrust of large grocery chains is strong, which has paved the way for retailers such as Whole Foods and Trader Joe's, which specialize in local, organic, and natural foods.

The demand for local foods in restaurants is also growing. The National Restaurant Association's 2013 Restaurant Industry Forecast reported that seven out of 10 consumers surveyed were more likely to visit a restaurant offering locally produced items, and six out of 10 said inclusion of local foods on the menu is a key attribute when selecting a restaurant. Also, locally sourced meats, seafood and produce and environmental sustainability were the top menu trends nationwide. As a result, restaurants often highlight local products and the growers from which they source their ingredients on their menus and websites.

Who Buys Local Food?

While we find that local food buyers tend to be well-educated younger adults (25-45), with higher incomes, single or with one or two children, the demographic profile varies by product type and region. Consumers' concerns about food safety, diet/health, the environmental impact and/or sustainability of agricultural production, their aim to sustain local agriculture and farmland, or a commitment to supporting local businesses are the main motivators behind the demand for local foods. Local food provides consumers access to high-quality foods, which they often rate as fresher, more flavorful, and with enhanced

shelf life. Direct interaction with farmers provides the opportunity to learn about farming practices, which engenders trust in food safety and quality, as well as the environmental impact of the practices used. Similarly, consumers often seek organic or natural foods and are more trusting of individual farmers than they are of large stores. Consumers also have the opportunity to purchase unusual or heirloom varieties, which may be difficult to find due to infeasibility of long-distance shipping or the lack of demand required by traditional grocery outlets. Finally, some consumers feel that there is the potential to reduce fossil fuel usage and greenhouse gas emissions by choosing local foods over conventionally sourced crops.

Do Consumers Pay More for Local Foods?

Do consumers pay more for local foods? The straight answer is yes, they do. While the premiums consumers are willing to pay differ greatly by product and region, they show an upward trend over time. More importantly, even in the recent economic recession (2008-2012) the demand for local foods continued to grow. In the Intermountain West, pricing premiums for local fruits and vegetables range from 20 to 80% depending on the product. Unusual varieties, such as heirlooms or popular seasonal selections like melons tend to bring the highest premiums. For meats, premiums for locally sourced cuts range from 15 to 60% and are highest for beef and pork. For packaged products, like cheese and ice cream, premiums range from 15 to 35%.

The "buy local" food movement continues to grow, but its expansion has shifted from summer farmers' markets and fresh produce, to the development and availability of processed local foods such as jams, salsas and chips, as well as winter and year-round farmers' and local markets. Winter markets are now common in the Salt Lake City and Denver areas, as consumers look to purchase local foods in the off-season. Fresh products at these markets often include produce grown in hoop houses, as well as stored, frozen, and processed products.



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