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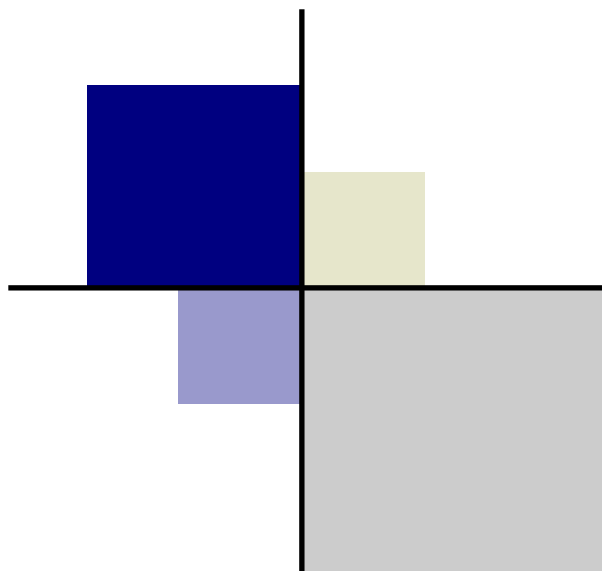
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Maintaining Intergenerational Solidarity in Mexican Transnational Families

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This study explored how Mexican transnational families maintain intergenerational relationships, using five of the dimensions of the intergenerational solidarity framework. Interview data from 13 adult migrant children who lived in the U.S. and their parents who lived in Mexico were analyzed. Structural solidarity was challenged by great distance between families. Families maintained associational solidarity by making contact frequently, though visiting was often restricted by lack of documentation. Functional solidarity was expressed through financial support to parents. This involved remittances sent to parents. However, it should be noted that it was often migrants' siblings in Mexico who managed these remittances. Affectual solidarity was expressed through statements of love and concern for one another. Normative solidarity and consensual solidarity reflected the value of familismo through financial support and the desire to live together. Several dimensions of intergenerational solidarity are interconnected. This study provides evidence for the relevance of the intergenerational solidarity framework in transnational families and suggests that geographic context is relevant when studying intergenerational relationships.

Keywords: transnational migrants, transnational families, intergenerational relationships

Introduction

In the face of financial uncertainty and hardship, many families use migrant work to address their financial needs (Portes, Escobar, & Arana, 2008). This often leads to a transnational family, where one or more members live outside their home country and others remain in their country of origin. Family separations across borders can last for extended periods of time, often years. Though research has addressed the financial support provided by migrant workers to family in the home country, little research has examined nonfinancial, family-based support and relationship changes while migrant family members are away for extended periods of time for work. This literature gap is noted in the call for increased study of the family in the context of

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globalization and transnationalism (Trask, 2013), and particularly for study of migrants' social support and relationships with families who remain in home countries (Portes et al., 2008).

In the United States, immigrants from Mexico account for 32% of all immigrants (Pew Hispanic Center, 2009). However, little research has addressed how Mexican migrants and their families maintain relationships that span borders. Research has focused primarily on transnational children and parenting; little has addressed the relationship between adult migrant children and their aging parents (Sun, 2012). Aging parents are frequently recipients of remittances sent home, particularly due to the lack of institutional resources for the elderly in Mexico (Orozco, 2004). Although elderly men are likely to be earning some income, elderly women are likely to depend on their families for support (Gomes, 2007).

Bengtson and Roberts' (1991) intergenerational solidarity framework is particularly appropriate for studying transnational, intergenerational relationships because it focuses on family solidarity across the adult life course and provides a lens to examine transnational families' unique patterns of unity. Therefore, this study used an intergenerational solidarity lens to examine the intergenerational relationships between parents in Mexico and their adult children in the U.S., thus providing evidence of ways that Mexican families maintain solidarity in a transnational context.

Literature Review

Following is a description of the intergenerational solidarity framework and a review of recent empirical studies on intergenerational relationships in transnational families. Although most studies did not explicitly use the intergenerational solidarity framework to frame the research, parallels to the five dimensions of the framework will be drawn. This review draws from research on transnational families, in general, noting relevant connections to Mexican family culture.

Theoretical Framework: Intergenerational Solidarity

The intergenerational solidarity framework, developed by Bengtson and Roberts (1991), explains patterns of solidarity among parents and adult children during the adult family life course. Solidarity is the union of interests, purpose, or sympathies among family members (Bengtson & Roberts, 1991). It describes how families are connected across generations (Bengtson & Roberts, 1991; Durkheim, 1933). Family norms, functional interdependence, and consensus among members are emphasized as important factors of solidarity in broader models of social solidarity (Durkheim, 1933; Roberts, Richards, & Bengtson, 1991). The framework includes six elements of solidarity, specifically between parents and their adult children:

structural, associational, functional, affectual, normative, and consensual (Bengtson & Roberts, 1991).

Structural solidarity. Structural solidarity refers to the structures providing or constricting opportunities for interaction between generations, such as physical proximity between generations, number of siblings, and health of family members. The impact of physical proximity is particularly relevant in transnational families, and several studies have documented difficulty in maintaining intergenerational relationships when families are separated by distance. Sands and Roer-Strier (2004) showed that when daughters moved to Israel for religious reasons, their U.S.-based mothers felt ambivalence, loss, and pain. Children who live in other countries experience a similar loss of connection with their parents. A qualitative study of 28 adult children who left Turkey to live in the U.S. indicated they felt ambivalent about how their connections with their parents changed after their relocation, and their level of closeness to their parents decreased (Şenyürekli & Detzner, 2008). Both studies found that geographic distance was associated with less frequent contact and close support among family members (Sands & Roer-Strier, 2004; Şenyürekli & Detzner, 2008), two aspects of associational solidarity.

Associational solidarity. Associational solidarity represents the frequency and patterns of contact between generations. While geographic distance makes it challenging for families to maintain strong family ties, transnational families find ways to do so on a regular basis. New communication technologies have increased the frequency of interaction and helped maintain emotional bonds among family members living in different countries (Bacigalupe & Lambe, 2011; Baldassar, 2007; Parreñas, 2005; Wilding, 2006).

Visiting in person is another way for families to maintain their relationships. Wilding and Baldassar (2009) explained that migrants from Australia, especially women, often visited their aging parents in Italy and Ireland and were always financially prepared in case they needed to make an emergency visit related to their parents' health problems. However, visiting is not always possible. Menjívar (2002) found that children who were born in Guatemala and raised in the U.S. were often undocumented and experienced barriers to travel to their country of origin to visit family members, even though parents made efforts to keep their children connected to their places of origin.

Functional solidarity. Functional solidarity is help and support provided through the exchange of resources among family members. In transnational families, functional solidarity is often realized through remittances, or money sent home to parents and other family members. In a study by Wilding and Baldassar (2009), migrant men often provided financial support to parents in Italy or Ireland as a strategy for maintaining intergenerational relationships. In Kodwo-Nyameazea and Nguyen's (2008) research,

Ghanaian adult children in the U.S cared for aging parents living in Ghana through sending remittances, which could be used to pay medical bills or maintain and build houses in Ghana.

Affectual solidarity. Affectual solidarity depicts the type and degree of closeness and positive sentiment among family members. In Kodwo-Nyameazea and Nguyen's (2008) study, the Ghanaian adult children claimed that providing care for their aging parents was their way of showing solidarity in the family; it was a means of expressing respect and appreciation to parents who had provided support in the past. This indicates that remittances have both a functional and an affectual purpose.

Normative solidarity. Normative solidarity indicates attitudes about the importance of family and values related to helping and supporting family members. Seelbach (1984) defined this as the expectations of children to provide for their parents. Research on parents with migrated children in rural China suggests that parents' evaluations of children's filial responsibility did not decrease after migration. Parents rated filial piety more highly if children sent financial support and if parents helped take care of grandchildren.

Consensual solidarity. Consensual solidarity refers to the degree of agreement on attitudes and values between generations. Many transnational families strive to keep their cultural norms of origin. Nesteruk and Marks (2009) found that Eastern European transnational families also maintained their beliefs and cultural norms that emphasized family connection and interdependence.

Cultural Context

Though recent studies have explored how immigrants across many countries maintain their family ties with family members in their country of origin (Kodwo-Nyameazea & Nguyen, 2008; Parreñas, 2005; Şenyürekli & Detzner, 2008), little research has examined family ties of migrants in the U.S. from Mexico specifically. Because research suggests that there are culturally-specific ways of talking about and conceptualizing caregiving (Wilding & Baldassar, 2009), the following section provides an overview of Latino family culture and its implications for caregiving.

The Latino family is embedded in a collectivist belief system that values interdependence across the extended family network (Falicov, 2001). Familismo refers to the value placed on extended families, including loyalty and a strong desire to maintain family ties (Dillon, De La Rosa, Sastre, & Ibañez, 2013). Even when physically separated, families remain part of a "web of family and intergenerational connectedness" (Falicov, 2001, p. 314). Familismo may be even

more salient during family separations, as a more flexible family system may mitigate parental absences (Dreby & Adkins, 2012).

Giving financial support, living together, and providing emotional advice most often reflect interdependence among family members (Falicov, 2001). Gomes' (2007) study found that parents provided financial help, services, gifts, and childcare to their children. Children also provide financial support to their parents. Among Latino adults 55 and older, parents felt their adult children were only peripherally involved in their lives, though they still demonstrated care in specific ways, such as providing support when a health need arose (Ruiz & Ransford, 2012).

Migration poses challenges to providing care to family members. Elderly parents in Mexico may require physical care that cannot be provided when children are physically absent and may suffer emotional losses due to separation from their children (Antman, 2010). In some cases, Latino parents may not even consider contacting a distant child for support (Ruiz & Ransford, 2012). Even though having a migrant child in the U.S. is associated with poorer health outcomes, it is unknown whether children migrate in response to parent's health concerns or if the concerns arise later (Antman, 2010).

Solidarity in intergenerational relationships is clearly relevant within Mexican families, but research is still needed on transnational families. Therefore, the purpose of this study was to explicitly apply the lens of the intergenerational solidarity framework (Bengtson & Roberts, 1991) to (a) identify examples of intergenerational solidarity between adult migrant children in the U.S. and their parents in Mexico and (b) to identify challenges to maintaining intergenerational solidarity in the Mexico-U.S. transnational family context.

Method

Dataset

This study used an existing data set of interview transcripts from a 2007-2009 research project titled "Mexican Agricultural Workers in Minnesota: A Study of Transnational Work and Family Issues," funded by the National Institute for Food and Agriculture International Science Education Program. Included below is a brief description of the original study's data collection procedures and sample description and of the current study's data analysis processes. [For a more complete description of the original study, see Solheim, Rojas-García, Olson, and Zuiker (2012).]

Minnesota-based participants were recruited by University of Minnesota Extension educators who had strong relationships within the Latino community. Eligible participants were Mexican

immigrants who were employed in agricultural jobs, had worked in Minnesota for under eleven years, were supporting family in Mexico, and had a family member in Mexico potentially willing to participate in the study. Extension educators contacted potential participants personally to establish their eligibility and to provide assurance that their participation would be kept confidential. After the Minnesota interview, immigrants contacted a family member in Mexico to request participation. After receiving notification of willingness to participate, Mexico-based researchers contacted the family member in Mexico and obtained consent. Native Spanish speakers in Minnesota and Mexico conducted the 60- to 90-minute semi-structured interviews. Interviews were transcribed verbatim in Spanish and then translated into English. Bilingual research team members verified the accuracy of transcripts and their translations.

Sample Description

The sample for this study was 13 adult children-parent pairs from the larger study. The adult children from Mexico were working in agricultural enterprises in Minnesota and were sending remittances to support their parents in Mexico. Parents who received remittances in Mexico from their adult children in Minnesota were interviewed. In four cases of parent's ill health or reluctance to speak, a sister or sister-in-law was interviewed. In three cases, a parent was interviewed concurrently with a sibling. Since these siblings discussed the adult child and parent's relationship and were the conduit between generations, their interviews were included for analysis.

Adult children in this study were born in Mexico and currently reside in rural areas in southeastern Minnesota. Parents in Mexico lived in six different states and eleven different towns, seven in urban areas and six in rural areas. Parents' average age in Mexico was 74 years, ranging from 48 to 88. Siblings included five sisters and one sister-in-law, whose ages ranged from 38 to 48 years, with an average of 43.67.

The Minnesota-based sample included five females and eight males. Their average age was 40 years, ranging from 27 to 50. One adult child held a university degree, three had graduated from high school, four graduated from middle school, two finished elementary, and three had less than elementary or an unknown level of education. Ten of the adult children were married, and three were single, divorced, or widowed.

Data Analysis

This study employed a deductive qualitative data analysis process, using an existing conceptual model to arrive at a better delineation of concepts and hypotheses by testing, refining, and refuting it (Gilgun, 2005). In this study, the intergenerational solidarity

framework was used to examine intergenerational family relationships in a transnational context.

First, using Bengtson and Roberts' (1991) definitions, interviews were read several times to identify text that related to the six dimensions of intergenerational solidarity: structural solidarity, associational solidarity, functional solidarity, affectual solidarity, normative solidarity, and consensual solidarity. Selected text included not only general examples of each dimension but also unique examples or challenges represented in Mexican transnational families' experiences. NVivo 8 software (QSR International, 2008) was used to organize the data.

Second, excerpts for each dimension were checked by two other members of the research team to assure that they accurately reflected the respective theoretical dimensions. In very few instances when differences among researchers emerged, they were discussed until consensus was reached. For example, one researcher initially thought that consensual solidarity was not represented in the text, but the researchers then discussed their identification of shared values present in several family interviews.

Third, once there was agreement that the interview text was accurately coded for each solidarity dimension, the selected excerpts from interviews were labeled and categorized to find dominant themes that captured the common characteristics of each dimension. Twelve themes were identified, including the six dimensions and six additional subthemes. All themes were discussed with the research team to reach consensus.

Trustworthiness

Trustworthiness in qualitative research refers to the standards used to protect the quality and accuracy of the data (Morrow, 2005). Trustworthiness is evaluated through credibility, transferability, dependability, and confirmability (paralleling quantitative criteria of internal validity, external validity, reliability, and objectivity; Lincoln & Guba, 1985). Credibility is achieved through sound methods. In this study, peer debriefing was the method used to ensure credibility. Team members discussed each dimension, confirming that the data reflected the identified theoretical dimensions and confirming the dominant themes. Transferability was achieved in this study by providing a detailed description of the sample and the context in which the data were collected. We demonstrate dependability and confirmability by providing quotations to illustrate the themes and reflect participants' voices, not those of the researcher.

Results

Evidence of all six dimensions of intergenerational solidarity was found during data analysis. Examples that illustrate each dimension are presented below. Examples are also presented that describe challenges to achieving solidarity in the transnational context.

Structural Solidarity

Structural solidarity is described by Bengtson and Roberts (1991) as structures that constrict or provide opportunities for interactions between generations. The geographic distance of family members due to migration of one or more family members represents a structure that limited intergenerational interaction. However, families overcame this challenge in a variety of ways. Migrants' siblings played a critical role in enacting structural solidarity across two countries and two generations.

Transnational family separation. It was apparent that transnational families experienced challenges in their ability to interact with one another due to large geographic distances separating migrants in Minnesota from their families in Mexico. But parents understood how economic challenges in Mexico propelled their migrant son or daughter to cross the border. They expressed their desire to be physically with each other but tolerated the separation in light of potential economic benefits. A migrant son whose parents lived in Mexico expressed his hope to stay in the U.S.:

Yes, but if I have the chance of living here, legally, being able to visit my relatives in Mexico, well, that would be fine, maybe I can see that dream of having my own business become real here, living here... We live with more comfort, we are better off, without the tension that means not knowing if you can make ends meet.

Parents' health problems. Interaction between migrants in Minnesota and their family members in Mexico increased when older parents experienced health problems. Remittances became crucial to the family's ability to obtain medical supplies. One migrant's sister stated: "And when my brother sends me some money, I also buy [our parents] the medicines they need, mainly for my father, who was very ill. In fact, Félix [sic] was supporting my father with us, for a long time."

Role of siblings in Mexico. Siblings in Mexico acted as migrants' 'agents,' using money remittances to take care of parents' needs. A sibling in Mexico said:

He asks me to try and manage the situation and the problems as much as I can, because sometimes he has a hard time, as he has his own financial problems. And he has his

family to take care of, and sometimes he asks me: “Help me, support me, so that our parents can solve their problems, lend me a hand”...He asks me to always take care of them and he promises he will support me, so that my parents (my mother now) don’t lack anything that is necessary.

Associational Solidarity

Associational solidarity is represented by the frequency and patterns of contact between generations (Bengtson & Roberts, 1991) through face-to-face and technology-assisted interactions. All of the families in this study were in frequent contact via telephone and Internet. Some families were able to visit one another, though several were unable to travel between countries due to lack of documentation.

Technology-assisted communication. Associational solidarity was maintained by all families in this study by talking with each other regularly. One sister-in-law in Mexico said: “...there is a distance between us because she left, but she keeps in touch with us, constantly.” Land phones were most frequently used because “on the line telephone at home that is the least expensive way.” Parents in Mexico considered phones a necessity to maintain contact with their adult children in the U.S.

Cell phones and the Internet allowed for photo exchange as a means to maintain intergenerational solidarity. However, elder parents’ lack of familiarity with the Internet was a barrier to its use. One migrant said:

My daughter uses Internet, which is much cheaper, but my parents don’t know how to use it. My mom doesn’t like the Internet. We used to write to her on the Messenger but she didn’t feel at ease talking to a machine. She wanted to hear my voice.

Parent-child conversations were mostly about their daily lives in Mexico and the U.S.: “...how they are doing, the weather, the house, if they need anything. About my brothers and sisters, about my dad, almost the whole week we get through.” Families also talked about remittance use. They discussed why and how much money was needed and whether, when, and how the migrants would send the money. A migrant son in the U.S. described these conversations:

[We talk] about how my dad is doing, if they have enough food, how my sisters and brother are doing, what problems they have had, if the house is all right, if they need money...Sometimes we talk about it (the purpose of sending money) on the phone, but then we usually send the money to one person only.

Visiting. Visiting was used to maintain associational solidarity but only if they could financially afford to travel. Five parents visited their adult children in the U.S. However, migrants rarely traveled to Mexico, and only when there were emergencies. One woman remembered that her migrant sister-in-law “came once, when her mother was seriously ill; she came to see her and to help her.”

The primary barrier to travel was that they lacked documentation that would allow them to re-enter the U.S. One sister in Mexico described how her brother “has never returned...simply fearing not to be able to go back [to the U.S.].” Four migrants in the study never visited Mexico after leaving; three visited Mexico only once during the 10 to 15 years they had lived in the U.S. A mother in Mexico shared: “She is sorry because she can’t come, as she doesn’t have papers. She would like to see us, and [her husband] would like to see her.”

Functional Solidarity

Functional solidarity (Bengtson & Roberts, 1991) was evident through remittances, not surprising because sending and receiving remittances was required for participation in the study. [For a complete description of the frequency and amount of remittances between generations in these Mexican transnational families, see Solheim et al. (2012).] For five Minnesota migrants, remittances were the only source of financial resources for their parents in Mexico. For others, remittances were sent for special purposes or to provide parents with an improved quality of life. Considering remittance behavior as an expression of functional solidarity revealed that for these transnational families, this exchange of money held deeper and symbolic meanings beyond an instrumental economic survival function.

It was difficult for migrants to be a long distance from aging parents; they could not provide any physical assistance when parents needed it. One migrant shared: “My parents are elderly people, they could pass away, they could get a serious illness, they could have a serious accident, and there is no way to come and go very quickly.” So adult children substituted financial support for physical support. One migrant commented: “When she tells me that she is ill...I keep thinking about her. So far away and I can’t help her, I can help her financially, but not comfort her morally or help her physically.” Another shared: “I am not there to see how they are doing and sometimes, sending a little money makes you feel better because you feel you are helping them.”

Remittances were sent to parents because they symbolically expressed care and concern by migrants for their parents, over and above providing for them financially. A sister in Mexico saw that receiving remittances made her parents and the migrant son in Minnesota feel better:

I don't think they would have problems, because [father's] retirement added to what he gets from farming...is enough for them to survive...Maybe, but if he sends money to them it is more to make them feel better, and not so much because they are in need. They won't stop having food if he doesn't send the money. But he feels better that way, because he is so far away.

One parent in Mexico was appreciative of her son's financial support:

I have had financial benefits thanks to them, because they are concerned about everything: they give me for food, they gave me to build a bedroom, everything, they have gathered money for me (for the operation), they have bought all the furniture, they have made improvements in my little house."

Affectual Solidarity

Examples of affectual solidarity, the type and degree of closeness and positive sentiment between family members (Bengtson & Roberts, 1991), were found in families in this study. Even from a distance, migrants relied on emotional support from their families in Mexico. A migrant daughter shared: "I think I would first ask my family to help me, mainly my family here, who are the ones who support me. And then, as regards the emotional aspect, I would ask support from my family in Mexico."

Parents in Mexico also worried about their adult children in the U.S. A mother with a 42-year old migrant son in the U.S. worried "that something bad happened to him over there without us knowing about it. An accident at his work, it is not unusual." This concern persisted and was reciprocated through migrants' worry about their parents, even though they tried to shield each other:

Sometimes, even the tone in our voice, we know each other well, I know when my son has a problem, because of the tone in his voice, and he knows me and he knows his grandma. So he knows when we have problems: "Listen, you have some kind of problem." "No. Well, yes. You see, this and that happened." And he worries.

Longing and enduring. Though Mexican transnational families in this study worked to maintain intergenerational affectual solidarity, these efforts were not always satisfying. Because affectual solidarity is symbolic, emotional, and about relational love, families were not satisfied with their attempts to enact affectual solidarity at a distance; a deep sense of longing was evident in participants' narratives:

I feel sad because I need him, as we have always been together all the time. Even when we talk each other on the phone, it is not the same as being with him. The truth is that it is quite hard to have your family so far away. It is emotionally difficult.

These families endured the situation because they understood the economic necessity or the opportunities for a better life in the U.S. One parent said:

Their absence is an empty space that they leave and you can't fill it. But with the idea that they are going to be better off, for example, that he could work and be better off over there, you become satisfied about their leaving.

Normative Solidarity

A cultural norm of familismo emerged in the dimension of normative solidarity, which indicates joint values about supporting family (Bengtson & Roberts, 1991). Across narratives, parents and migrants expressed the importance of family. A migrant stated: "Our goal must be our family's welfare, as much for my family here as for my family back there." Universally, migrants would live with and care for their parents if their situations allowed it. A migrant son in the U.S. shared his hope: "I would have my own little house and I would take care of my folks as long as they live." A migrant's sister in Mexico stated: "His greatest wish was to try and take our parents with him, and, well...he has been struggling to manage that, but unfortunately our parents were too elderly. It was always his wish, but he couldn't achieve that."

Consensual Solidarity

Finally, consensual solidarity indicates the degree of agreement on values between generations. The value of education was particularly salient and consistent across generations. When one mother was asked if her son's migration was worthwhile, she stated: "Yes, because he came to learn something." Her son similarly described his primary goals as educational, stating "I want to obtain a college degree...I want to graduate from university and then have a family."

Discussion

The purpose of this study was to understand how Mexican transnational families maintain intergenerational solidarity despite the challenges of a transnational context. The geographic distance that separated family members made structural solidarity very difficult. However, families found ways to stay connected and maintain a sense of family through other dimensions of solidarity.

Culturally, Mexican families are grounded in a strong sense of familismo which emphasizes the importance of family and interdependence among members (Falicov, 2007). This shared value, evidence of normative solidarity, provided strong motivation on both sides of the border to maintain family connections. Nesteruk and Marks (2009) found a similar motivation in their study of Eastern European transnational families.

Based on this motivation, family members in this study made significant efforts to stay in touch with one another (associational solidarity). Similar to other transnational families, migrants in the U.S. and their parents in Mexico kept in touch primarily through phone calls and via the Internet (Baldassar, 2007; Wilding, 2006). It was evident that families maintained their closeness (affectual solidarity) by expressing love, emotional support, and concern for each other over the phone and online. Family members longed for each other but endured their situations because children had better opportunities in the U.S.

Because adult children in Minnesota were unable to freely travel to Mexico, they tended to substitute financial support for physical support. Remittances from adult children to their parents were conduits for expressing love and concern for parents and reflected a cultural norm of interdependence in Mexican families. Structurally, siblings in Mexico became a significant bridge between parents who were experiencing health problems and the Minnesota-based migrants who were unable to provide physical support.

Results of this study indicate that some dimensions of intergenerational solidarity were interconnected. In Mexican transnational families, making contact and sending remittances were important methods to express love, support, and concern. Remittances also reflected the norm of interdependence in Mexican transnational families. Thus, results suggest that associational solidarity and functional solidarity are connected to affectual solidarity, and functional solidarity is connected to normative solidarity in this transnational context.

Limitations

One limitation of this study arises because the data were collected for other purposes; specific questions relating to intergenerational solidarity were not asked. For example, consensual solidarity could not be thoroughly explored as the original study did not ask questions to ascertain agreement on values, attitudes, and beliefs between generations. Future research could formulate specific questions that more deeply explore the constructs of Bengtson and Roberts' (1991) framework. Additionally, this study included only migrant workers who sent remittances to their families. Thus, it is impossible to identify other forms of support and solidarity in this dataset.

Finally, the interviews were conducted in Spanish and translated into English. As a result, participants' thoughts expressed in their native Spanish language might have been less precise after translation into English. However, great care was taken to minimize those inaccuracies through a thorough review by bilingual researchers on the team.

Implications

Findings from this study have implications for employers, policymakers, family educators, and clinicians. Findings can help sensitize employers of transnational migrant workers about the stress that arises from being far away from aging parents. Providing flexibility in vacation time and emergency family leave would give migrants the ability to travel home to attend to ailing parents.

Current policy deliberations would benefit from a better understanding of transnational families. The families in this study were all employed in the agricultural industry that depends on migrant labor to fill jobs. Migrant workers with aging parents in Mexico would benefit from policies that would reduce travel barriers and allow them to travel to their home country without concern for being unable to return. There have been some recent immigration policy shifts to allow for such visits. For example, *Deferred Action for Childhood Arrivals* allows immigrants who came to the U.S. illegally as children to receive an exemption from deportation, and they may apply to travel to visit ailing relatives or to attend funerals (U.S. Citizenship and Immigration Services, 2015). Such policies allow immigrants to fulfill important family roles and then return to their jobs in the U.S.

Family educators can expand their conceptualizations of support to include the many types and methods of intergenerational solidarity and can help their clients recognize and strengthen their available methods of connection. Family educators might also help parents think about ways to increase closeness with children who remain in the home country. Sharing rituals of connection via technology communication may be adapted for a transnational context (Bacigalupe & Lambe, 2011). Results of this study demonstrate many meaningful and creative strategies that transnational families employ to maintain intergenerational solidarity.

Family educators who work with migrant families on financial management would benefit from understanding how remittances represent more than financial support; they also symbolize love, care, and an important means to maintain intergenerational solidarity. It is important to note that family, including aging parents, plays a considerable role in immigrants' money management choices. Financial education could involve the broader family in planning and budgeting choices. Educators can respect the need for remittances and/or travel to be included in budgeting and saving plans.

Finally, these results also suggest that family clinicians should carefully assess how a client defines family and how this might include members in another country. Such an approach will minimize the risk of diagnosing depression without recognizing the underlying stress of separation (Falicov, 2007).

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The Influence of Problem Solving Style on Team Dynamics When Building Consensus

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Issues facing the agricultural and natural resource (ANR) sector can be contentious due to opposing viewpoints, with people working against one another rather than working together to come to consensus on what will benefit the industry as a whole. Without a consistent message, the ANR industry will struggle when trying to gain support from decision makers. Therefore, opinion leaders need the skills to bring individuals and organizations together when facing critical issues that require groups to reach consensus. Agricultural leadership programs can offer educational opportunities for individuals to build problem-solving and team-building skills that will enable them to lead discussions when facing current issues. Unfortunately, little is known about how opinion leaders in the ANR sector work together when facing critical issues or how diverse cognitive styles influence this process. This study explored how cognitive style influenced team dynamics while ANR opinion leaders built consensus around critical ANR issues. Results illustrated that grouping participants by cognitive style influenced how the teams progressed through the consensus building process. The findings and resulting recommendations can assist educators in being selective when assigning groups and developing team-building activities that will prepare ANR opinion leaders to lead cognitively-diverse teams when building consensus.

Keywords: leadership, opinion leaders, issues, consensus building, problem solving

Introduction

The agricultural and natural resource (ANR) industry continually faces contentious issues where those directly involved in the ANR industry work against one another, due to opposing viewpoints and needs (Grudens-Schuck, 2003). Examples of contentious issues facing the ANR

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industry include water, food safety, obesity, agriculture practices, environmental impacts, and cultural conflicts (Grudens-Schuck, 2003). Rather than working together to come to consensus on what will benefit the industry as a whole, players in the ANR sector often argue amongst themselves on the best course of action (Chiarelli, Stedman, Carter, & Telg, 2010).

Unfortunately, without a consistent message, the ANR industry struggles when trying to gain support from decision makers (Chiarelli et al., 2010). Therefore, opinion leaders within the ANR industry need the skills to bring individuals and organizations with divergent views together when facing critical issues to reach consensus (Whent & Leising, 1992).

Agricultural leadership (AL) programs develop agricultural practitioners' ability to serve as opinion leaders (Lamm, Lamm, & Carter, 2014; Valente & Davis, 1999), or people with a large amount of influence within the broader population they represent (Rogers, 2003). As opinion leaders, AL program participants need the skills to diffuse information about the most current issues (Valente & Davis, 1999). Part of this process is being able to work collaboratively to reach consensus and develop a consistent message. Research has shown that cognitive diversity can play a large role in team cooperation and should not be ignored when trying to build consensus (Kirton, 2003). Therefore, opinion leaders with the ability to work strategically with others of diverse cognitive styles will be more likely to gain the large-scale support they need to develop and implement sustainable solutions (Rogers, 2003). However, little is known about how opinion leaders work collaboratively to disseminate information and teach others about critical ANR issues. Research on how cognitive styles impact team dynamics in opinion leaders can, therefore, inform the development of educational experiences that promote collaborative consensus building skills (Lamm et al., 2012).

The use of problem-solving strategies in agricultural education is common due to the numerous benefits, including an enhancement of problem-solving ability, critical thinking skills, and the ability to relate to others (Boone, 1990; Cano & Martinez, 1991; Phipps, Osborne, Dyer, & Ball, 2008). AL educators are often required to arrange program participants into small groups when facilitating group-learning experiences. Research has shown a variety of factors influence the experience of a group, including learning styles, personality styles, and problem-solving styles (Briggs Myers, McCaulley, Quenk, & Hammer, 2009; Gokhale, 1995; Kirton, 2003; Lamm et al., 2012). Well-structured groups should allow participants to "share their conceptual and procedural knowledge...so that all [participants] are actively engaged in the problem-solving process and differences of opinion are resolved" (Heller & Hollabaugh, 1992, p. 637).

Participants of AL programs are often put into situations where they wrestle with complex issues (Lamm et al., 2014) and serve as a bridge to bring individuals with opposing viewpoints together to reach consensus (Chiarelli et al., 2010). The purpose of this research was to gain an understanding of how problem-solving style influences this process. As a result, this research should assist AL educators in deliberately designing consensus building activities with cognitive

diversity in mind, resulting in more effective teaching and learning processes. Participants will then be able to more effectively lead cognitively-diverse teams when building consensus around critical ANR issues and get the support needed for the ANR industry.

Theoretical Framework

The theoretical framework for this study was based on both Consensus Building Theory (Susskind, 1999) and Adaption-Innovation Theory (Kirton, 2003).

Consensus Building Theory

Consensus Building Theory (Susskind, 1999) was chosen because it clearly identifies the four steps that need to be followed in order to effectively lead cognitively diverse teams when building consensus around critical ANR issues. The four steps are convening, clarifying responsibilities and strategies, deliberation of issues and barriers to address issues, and decision and implementation (Susskind, 1999).

According to Susskind (1999), individuals or groups in a position to bring key stakeholders together, or opinion leaders based on Rogers' (2003) definition, initiate the convening step. During the second step, clarifying responsibilities and strategies, formal roles and responsibilities of group participants, ground rules, and the agenda of the work of the group are established (Susskind, 1999). The third step, deliberation, is crucial to consensus building as it "pursues deliberations in a constructive fashion" (Susskind, 1999, p. 44). Deliberation is accomplished by expressing concerns in an unconditionally constructive manner to maintain a problem-solving approach (Susskind, 1999). Other aspects of the deliberation step include not trading interests for relationships, engaging in active listening, brainstorming, and seeking ways to bridge differences (Marshall, Solomon, & Steber, 2001). The fourth step, decision and implementation, occurs when the group assesses the agreement they have reached (Susskind, 1999). Action items, such as presentations, are formalized during this phase. A detriment of consensus building theory is it often focuses too much on the process while ignoring the impacts of diverse values, cultures, and identities (Schön & Rein, 1994).

Adaption-Innovation Theory

Adaption-Innovation Theory (A-I Theory; Kirton, 2003) is a way of describing cognitive style or "the preferred way in which people respond to and seek to bring about change" (p. 43). A-I Theory was chosen for this study because disparities in cognitive style result in creative problem-solving differences between individuals that can cause issues when trying to build consensus (Kirton, 2003). Individuals from opposing organizations wrestling with agricultural or natural resource issues often come to the table with different problem solving styles, as well as issue-

specific differences. An understanding of cognitive styles, as well as ability to work with diverse cognitive styles, has been found to be critical to problem solving success and may assist opinion leaders in leading tense discussions and building consensus around issues (Kirton, 1976).

A-I Theory (Kirton, 2003) divides individuals into cognitive styles on a continuum between adaptation and innovation. Individuals with an adaptive tendency prefer more structure, while those with an innovative tendency prefer less structure (Kirton, 2003). Adaptors seek “better” solutions by suggesting more technically efficient ideas. Innovators seek “unique” solutions. Innovators will push the boundaries of the environment and often require the realignment of objectives or strategies to ensure success (Foxall, 1986; Kirton, 1999).

There are benefits and challenges to identifying and utilizing problem-solving styles in the realm of group work. Homogeneous groups, consisting of all adaptors or all innovators, are expected to collaborate easily and will likely experience success in narrow projects because they get along (Kirton, 2003; Lamm et al., 2012). However, success with larger, more ambiguous projects will become difficult for homogeneous groups to handle (Kirton, 2003; Lamm et al., 2012). When too little structure is present, adaptor groups will become inefficient and stuck because they long for direction. On the opposing side, when too much structure is enforced on a group of innovators, they become frustrated (Kirton, 2003). Innovators find themselves trapped by the limitations of structure and feel they do not have the ability to express themselves broadly to make the changes they perceive as necessary for success.

When heterogeneous groups (i.e., a mix of adaptors and innovators) are put together to solve small problems, they may experience communication issues as a result of differences in approach (Kirton, 2003). Adaptors often find innovators’ ideas as lofty and intangible, while innovators find adaptors too structured and unwilling to explore possibilities that do not fit into their current paradigm. However, heterogeneous groups become more efficient when presented with large, complex problems because individuals exhibiting cognitive differences approach the different aspects of problem solving from unique perspectives. Innovators offer a surplus of “outside-the-box” ideas and adaptors are able to take those ideas, narrow them down, and determine what will work in the real world (Gokhale, 1995; Kirton, 2003). Therefore, it is expected that cognitively-diverse teams of opinion leaders would have an easier time building consensus around ANR issues.

Purpose and Research Questions

The purpose of this study was to examine how grouping by problem-solving style based on A-I theory (Kirton, 2003) influenced opinion leaders’ ability to work collaboratively when progressing through Susskind’s (1999) four steps of consensus building around an ANR issue. The purpose was guided by the following research questions:

1. How do groups of ANR opinion leaders progress through the consensus building process?
2. How do adaptor and innovator characteristics influence team dynamics of homogeneous and heterogeneous problem-solving style groups when consensus building?

Methods

The researchers used social constructionism to inform the design of the study because “while humans may be described, in a constructionist spirit, as engaging in their work and making sense of it, such a description is misleading if it is not set in a genuinely historical and social perspective” (Crotty, 1998, p. 54). The social constructionism perspective emphasizes that while humans are individuals, rarely are choices made without social influence (Crotty, 1998). Based on the research design, focus groups were chosen as the data collection method with the intent of capturing the social dynamics of consensus building (Chalofsky, 1999, p. 1).

Participants of AL programs were chosen as the population of interest based on their identified role as opinion leaders within the ANR industry (Kelsey & Wall, 2003). Alumni of AL programs nationwide are expected to work with one another and organizations to build consensus around critical ANR issues (Lamm et al., 2014). Therefore, a purposive sample of 30 AL program participants involved in the current class of the Wedgworth Leadership Institute at the University of Florida were chosen because they were recognized as emergent leaders within their respective fields of expertise (Lamm et al., 2014) and had an interest in pursuing larger leadership roles within their organizations, industries, and communities.

An agenda-building project was included as a component of the AL program for the purposes of this study. Prior to engaging in the agenda-building project, participants had the opportunity to become familiar with one another but had not yet worked in a group setting or come to consensus on an issue of importance. The agenda-building project was designed to simulate a real-life experience in which a participant may be put into a situation where they have to build consensus with whom they are familiar but had not previously engaged in a group process. In preparation for the agenda-building project, the participants completed an online questionnaire to identify three ANR issues they believed were most important in their state. The results indicated water, immigration, and agricultural regulations were the most important issues and served as the issues of interest. While taking the questionnaire to identify important issues, the participants also took the Kirton Adaption-Innovation Inventory (KAI) to assess problem-solving style (Kirton, 2003). The KAI consists of 32 Likert-type items that produce an overall score ranging from 32 to 160 (Kirton, 2003), with low scores indicating someone is more adaptive and a high score indicating someone is more innovative. Participant KAI scores ranged from 64 to 129, with 17 considered adaptors and 13 considered innovators.

For the agenda-building project, the participants were taught what an agenda was, how to build an agenda, how to discuss political topics with stakeholders, and the importance of communicating properly with decision makers. The participants were then divided into six small homogeneous problem-solving style groups based on their KAI scores. The adaptors were each randomly assigned to an adaptor group and the innovators were randomly assigned to an innovator group to ensure high and low scores within each designation were mixed among the groups. The six groups were given two hours to reach consensus while building an agenda. Three adaptor groups were each assigned water, immigration, or agricultural regulation, and three innovator groups were each assigned water, immigration, or agricultural regulation. The groups were given a worksheet that asked them to reach consensus on (a) defining the issue; (b) identifying what about the issue will most likely resonate with policymakers; (c) identifying specific tactics they would use with a policymaker; and (d) determining what they intended to do/say when a policymaker was open to, opposed to, or neutral in regards to their position.

At the conclusion of the first two hours, the adaptor homogeneous groups were paired with the innovator homogeneous groups to form three larger heterogeneous groups, each focused on a separate issue. Participants were told to reach consensus on their issue-specific agenda in a two-hour time period. Each team was required to have a PowerPoint presentation at the conclusion of the session to present to the entire group. The educators gave minimal guidance during the group project time.

Data Collection

Three focus groups were conducted, one with each of the heterogeneous groups, at the conclusion of the project. Each focus group lasted approximately one hour. All respondents were coded for confidentiality with a pre-assigned letter designating their problem solving style (i.e., *A* = adaptor group; *I* = innovator group), letter designating the issue they were addressing (i.e., *W* = water; *I* = immigration; *R* = agricultural regulation), and number based on the order they first spoke. Three moderators conducted the focus groups simultaneously.

During the focus group sessions, the moderators asked questions about (a) problem solving, such as, “How did you go about solving the problem you were faced with?” and (b) working in teams, such as, “Did team members approach the problem differently?” The moderators provided minimal input and allowed the conversation to flow naturally. Effort was made to gain input from all participants. The focus groups were audio recorded, transcribed, and compared with the recordings for verification and elaboration. Observations made by the moderators, interviews with the AL program educator, and participant open-ended reflective statements provided sources and methods to triangulate the data (Lincoln & Guba, 1985). Data from these sources were used to confirm the findings of the focus groups through a review process after data

analysis was completed but were not included in the results as data saturation was reached through the data obtained during the focus groups (Lincoln & Guba, 1985).

Data Analysis

Content analysis (Holsti, 1969) was used to identify themes related to consensus building to answer the first research question. The purpose of content analysis is to divide data into categories *a priori* based on a theoretical model, in this case Consensus Building Theory (Lincoln & Guba, 1985; Neuendorf, 2002). Themes were allowed to emerge surrounding the impact of problem-solving style on the consensus building process to answer the second research question. In order to address observer bias, two coders were used (Lincoln & Guba, 1985). To address personal bias, coders were chosen that did not have any contact with the focus group participants and were not familiar with the programmatic content. One coder was a postdoctoral assistant that was familiar with ANR issues and the other coder was a research assistant without a background in agriculture but extensive knowledge of qualitative analysis. The coders were aware that the groups were manipulated based on problem-solving style and reviewed generalities about Consensus Building Theory and A-I Theory together prior to reviewing the focus group transcriptions (Lincoln & Guba, 1985). To ensure trustworthiness, the coders identified patterns, themes, and relationships separately and then came together to reach agreement. An audit trail was kept to ensure trustworthiness and faculty mentors were used to discuss the coding process and results for peer debriefing (Lincoln & Guba, 1985). To ensure transferability of the data, background information on the participants was collected (Lincoln & Guba, 1985). The 30 participants for this study were all engaged in the Wedgworth Leadership Institute at the University of Florida with 40% of the participants being female and 60% being male, ranging in age from 27 to 55 years of age. Twenty-seven of the participants were White, two were Hispanic, and one was Asian.

Results

RQ1: How Did the Groups Progress through the Consensus Building Process?

Three themes were identified within the data based on the last three steps for consensus building: clarifying responsibilities and strategies, deliberation of issues and barriers to address issues, and decision and implementation (Susskind, 1999). The first step, convening, did not emerge as a theme but, upon reflection, the researchers noted they had completed the first step when they organized the groups.

Clarifying responsibilities and strategies. In order to clarify their responsibilities and strategies for the task at hand, participants reflected upon using resources, being affected by time constraints, dealing with the uncertainty of the activity, the merging of personalities, and the

development of team member roles. Participants discussed making use of information they learned as a part of their AL program and seeking outside information to clarify what they should be doing. IW1 said,

It was difficult to start with the large amount of research collection that was needed and then to meld the other group's same consideration material into a presentation...But having [program presenter]'s theory, tips, and tactics was helpful.

IW2 said, "[IW1] wanted to pull from two or three websites that she knew of, [AW5] and her group got ahold of Farm Bureau..., [IW8] brought great pictures. You have to use all sources of information." The Immigration group indicated they had trouble using resources. AI3 said, "We didn't have enough available technical computers for us all." In response to a question about using additional resources, AI8 said, "That's what we didn't have time for. By the time we got there, I was freaking out a little bit because people were trying to look stuff up."

Participants in all three focus groups mentioned the time constraints as a barrier, particularly after merging into the larger group. AW5 said, "We had less time. Less time and more people...more opinions, more information." Suggestions were made to improve the time allotment of the activity. AI8 said, "I'd love to have an hour at the beginning for the small group and two hours with the big group." The time constraint affected what the group members were doing. In the large group, AI4 said, "Some of us had to stop talking so much just to get this done. Unless you totally disagreed with it, that's when people would chime in again." While some participants viewed the time constraint as negatively affecting outcomes, others viewed it benignly or even positively. IW8, who stepped into a leadership role, said, "I will step up and do stuff like that when I know we've got a deadline and I see craziness, but if we would have had a half a day, I would have sat back and just listened to [the group]."

A major issue for many of the participants was the uncertainty of the activity. II2 stated, "I wasn't clear on specifically what the outcome was." IR1 stated, "It was real like [confusing] in the beginning, I was like, 'Okay, where do we start? We really need to get organized, but I don't know what to say or know how to help.'" To get past this uncertainty, many of the participants wanted more information or a better explanation. AI5 said, "Additional information on what our end product should have been would have helped us... We wouldn't have spent as much time trying to figure out what we needed to do, doing what we did." A tactic for getting past the uncertainty was narrowing down the topic. IW9 stated, "Are we going to go this broad with it? No, you probably can't do that because you don't have the time to do that."

As a part of the clarifying responsibilities process, the groups had to deal with merging members' personalities. Overall, the variety of personalities and viewpoints were valued. AR7 said, "I think any time you do something like this, you're going to improve your problem-solving

skills just working with different personalities.” While different personalities were valued, they could be problematic, particularly when the homogeneous groups merged to become larger heterogeneous groups. AW6 said, “We had formed that small group and whatever, and now you had to go, ‘Okay, one more step.’ You had to grow one more time, so it was almost like you were double processing again.” One aspect of this merging of personalities was ensuring that everyone was listening and being heard. AW5 said, “We’re all strong leaders and strong personalities, so I know that’s a challenge for me.” AR9 said, “I listen way too much. I need to get my opinion out there and let the rest of the people hear it, and they can take it.”

The development of team members’ roles within this stage was important to the consensus building process. The Regulation group spent the most time talking about the roles team members took. AR5 said, “When [IR2] got up and kinda took the lead, spearheaded it, everything kind of funneled that way.” As for how roles were decided, IR2 said, “it was pretty natural. I don’t know how that happened, but it kind of naturally fell. Everybody fell into place.” AR9 responded to this, saying, “I can tell you how it happened in my opinion, you [IR2] getting up and taking the bull by the horns.” The statements of roles and how they occurred were similar across groups. Different individuals filled different roles, and this was valued.

Deliberation of issues and barriers to address issues. When deliberating about issues and the barriers they needed to address, participants discussed narrowing down the issues to be more specific, incorporating the different perspectives of team members, and the merger of the small groups. Due to the broad nature of the issues, the groups narrowed down to focus on specific aspects of the issues. IR3 said, “It was such a big question... We tried four different ideas before we found the one we... ended up going with.” Narrowing down involved taking into account the various perspectives and ideas offered by group members. IR2 said, “We just threw everything up on the board, figured, okay, if we can just get all the thoughts out there when we get together with the ten of us, we will be able to narrow it down.” Part of this narrowing down process included components that would not make the final presentation. II9 said, “One of the things I thought was interesting was that a lot of the stuff we talked about didn’t matter for the presentation.”

Participants described that the main benefit of incorporating the different perspectives of team members was that it improved the discussion. AR6 said, “Brainstorming is more effective with a few more people.” During the discussion process, group members were able to learn from each other. AW3 said, “I would never have put tourism with this... You know, there’s so many things that were interrelated that we don’t do a good job looking at others’ perspectives.” While sharing perspectives tended to be positive, it became contentious with the Immigration group. In particular, some of the group members had issues working with one of the adaptive members. AI6 said, “And at one point, we beat up on [AI5] pretty good because he is in the cattle industry, and he doesn’t have the same labor needs that some of us have.”

The merging of the small groups also had effects on the discussion process. Participants in all three focus groups remarked that the small groups were similar in their ideas. AR5 said, “The good part was when we joined with the other group, we made the comment that we had the same points.” Despite the similarities, there were still difficulties melding the groups. IW9 said, “It was kind of like ‘Are people arguing?’ No, they’re not arguing. They’re sort of going past each other, not realizing they’re saying the exact same thing, just phrasing it a little differently.” The merger affected how some individuals contributed, including some who did not contribute as much. AR10 said, “You [AR9] were talking a lot in our smaller group, and then I noticed when we got into the bigger group, you quieted down again.”

Decision and implementation. When discussing the decision and implementation phase, participants reflected on how they would act with policymakers and the process they went through to create an end product. The Water group had the most discussion about how they would act when meeting policymakers. For some of the participants, the process was viewed as a blueprint they could use when they travelled to Washington, D.C., later in their AL program. AR6 said, “Thinking about it, how’s it going to be, what am I going to say? And this is a nice opportunity to be part of that blueprint to take with you and to prepare.” Since the other AL program participants were going to use their product in Washington, D.C., the results were identified as important. AW5 said, “Whoever is the spokesperson, that we are all in agreement and we are all sitting there endorsing it because we are going to go in groups to visit our congressman.” Part of this process for many participants was learning to understand the situation in which they would be operating, including the need to make an impression on the policymakers and the fluidity of policy situations. IW1 said, “We kept trying to think of how can we find and present information that makes it personal back home, affecting them and their responsibility to their constituents.” IW2 said, “We have to be fairly realistic in the issue, though. Let’s say we did go to Washington and something did happen fast there. And we had to change our direction...The urgency is real.”

The Immigration group spent the most time reflecting on the process of consensus building; however, statements from other groups reflected an appreciation for the work that goes into the lobbying process. IW4, in talking about their current activity and prior experience meeting policymakers, said, “The lobbyists had already done all their work so it made me appreciate what the organizations do ahead of time.” Participants also remarked about the differences between groups’ final presentations. II7 said, “It was interesting to look at everybody’s presentations because they were all a little bit different in the subject matter...Everybody had a different takeaway on what we were supposed to be doing.”

RQ2: How Did Adaptor and Innovator Characteristics Affect Team Dynamics of the Homogeneous and Heterogeneous Groups?

The results for the second research question emerged as the coders reviewed the consensus building process. The emergent data broke down into three themes: diversity in perspectives on problem solving, comfort with ambiguity, and leadership roles.

Diversity in perspectives on problem solving. There were differences between innovators and adaptors in their perspectives on problem solving. The adaptors preferred narrower topics and incorporating more detail and structure into their discussions, as well as providing counter viewpoints to add depth. Innovators preferred broader topics and had more unstructured brainstorming in their small groups. The innovators also expressed fewer issues with the time constraints of the activity.

Participants' perceptions of the level of detail varied between adaptors and innovators. The adaptors reported being satisfied with the level of detail and thoroughness covered. AR5 said, "I thought we were very thorough in everything that we discussed. We definitely got all our ideas out there." The innovators tossed around ideas to be narrowed down later in the process. IR2 said, "It just started with 'Okay, throw it all out there; we haven't even researched this issue a lot. It's just based on what we know or, maybe, what we've learned along the way.'"

Participants also reflected upon their preferences for narrow versus broad topics, with adaptors preferring to have a narrow topic, while innovators were satisfied with broader ones. AW5 mentioned the struggles in the small group, saying, "We needed to get way down to one topic and not be so broad because you can't cover that broadness in the amount of time that congressman's going to give you." AI5 stated, "We gave up on trying to give a detailed, dumb answer and gave a vague answer." On the other hand, some innovators enjoyed keeping their answers broad, and one group even chose this specifically for its potential impact on a congressperson. IW9 said, "We need to go with a broader base that does affect us, and we can tell that story, but we can also pull in how it affects other people."

When in the large group, adaptors often provided counter viewpoints. Speaking of her behavior in the large group, AR10 said, "When the bigger group came together, I found that I was trying to do the opposite, 'Let's think about it this way,' or 'Don't forget about this.'" The Immigration group mentioned that two people played "devil's advocate" for the group, and both were adaptors. Some adaptors wanted more time for the large group discussions to meet their satisfaction. AI5 said if the group "could have had another hour" their answers would be more thorough. Some innovators, however, did not feel more time was needed. II9 said, "I don't think we need more time. I think you're going to take as much time as you're given."

Comfort with ambiguity. Both groups expressed confusion over the goals of the activity. For example, an innovator (IR3) believed the assignment would have been clearer and the task easier if the participants had “been told upfront, so they could create a blueprint.” However, adaptors specifically expressed a need for additional information on several occasions. AI4 shared, “I think the challenge was to take this vague stuff and create something from it.” AR7 said, “We spent a lot of time in the beginning just worried about whether we were doing it right,” and AR10 said, “It was overwhelming to have that presentation. And to not glean everything from it that I needed, then have to go back and read my notes.”

Leadership roles. In two of the three groups, the leadership role was taken on by an innovator with positive results. An adaptor took on the leadership role in the third group, resulting in conflict. IR2, who stepped into the role of facilitator for the Regulation group, received praise and appreciation for tackling this challenging role. Many of the members of this group mentioned how this role was not given, but she “stepped up” into the role. Describing her role, IR2 said,

I think I was in a good position because I was kind of standing up so I could see everybody...It was good to kind of be able to stop and say, “Wait, so and so is trying to say something. Let’s stop and let them finish their thought before you start.”

In the Water group, another innovator was appreciated for stepping up to help the group move forward. IW4 said, “I think we were lucky that we had [IW8]...She’s over there already working on stuff...and I think that’s what really got us focused.”

While innovators stepping into leadership roles helped facilitate the process for the Water and Regulation groups, an adaptor stepping into a leadership role caused tension in the Immigration group. II1 said they “buted heads.” While AI5 took the leadership in typing up the presentation, there was tension when AI5 would not allow the presenters to dictate to him what they wanted to say. AI5 said he “couldn’t see how [some ideas] fit into the presentation.” Other group members said he was playing the “devil’s advocate” and pushing the group to see other sides of arguments. This elicited frustration in team members, particularly for lengthening the discussion, which culminated in the group nearly running out of time.

Conclusions

While able to complete their task and progress through all four steps presented by Consensus Building Theory introduced by Susskind (1999), the uncertainty participants felt resulted in differing levels of success among the six homogenous groups. These results were consistent with prior literature using A-I Theory (Kirton, 2003), indicating adaptors held a preference for structure while innovators enjoy being unrestricted (Lamm et al., 2012). When the groups were

merged into the three larger heterogeneous groups, the diverse perspectives offered were valued but also caused tension. For example, the Immigration group faced challenges when an adaptive member would not listen to innovative members as they worked to develop their final presentation. Previous research has shown that communication problems arise when group members are working with individuals dominant in the opposing style because of differences in approach (Kirton, 2003). However, this finding differed from Lamm et al. (2012) that found heterogeneous groups were more successful at solving large-scale, ambiguous projects than homogenous groups.

While never explicitly discussed, leaders chose to step up without prompting in all three heterogeneous groups. Perhaps this was due to the selection process used for admittance to the Wedgworth Leadership Institute, with all participants identified as emerging leaders within their respective areas. In the Regulation and Water groups, innovators stepped into leadership roles and were perceived positively. In the Immigration group, an adaptor stepped into a leadership role, leading to difficulties when they discussed counter viewpoints. Because of these difficulties, the Immigration group indicated they did not fully explore all issues and interests before reaching consensus. While time was a barrier for all of the groups, only the Immigration group indicated it prevented full discussion. The Immigration group also had more difficulty organizing itself with an adaptive leader, likely affecting the ability to fully discuss different aspects of the presentation. Therefore, while Heller and Hollabaugh (1992) found diverse groups allow for the active engagement of all participants, the findings from this study show group structure (e.g., problem-solving style of the leader within a group) may also play a role in the group's ability to build consensus. It is possible innovators were better suited to be leaders due to the ambiguous nature of the task assigned matching their preference to be free of constraints and consistent with A-I Theory (Kirton, 2003).

It is important to recognize the limitations of the study in the interpretation of the results. Being qualitative in nature, the results can only be used to describe the participants of this study; therefore, extrapolation to a larger population is limited. In addition, the participants are all from one state AL program, limiting the findings to their experience.

Implications and Recommendations

Recognizing the limitations, the findings have implications for the development of AL programs, as well as for working within the ANR industry. The results imply AL programs may do well to incorporate educational experiences that identify and exacerbate problem-solving style differences so that participants can practice working with differing viewpoints. Within this study, the ambiguity of the problem impacted the innovators and adaptors differently. AL programs may want to incorporate situations in which the activity is vague or very explicit in order to draw out the particular strengths of innovators and adaptors. Minimizing ambiguity may

lead to more leadership activity amongst adaptors, while maximizing ambiguity may lead to more leadership activity amongst innovators, as was the case in this study. In addition, incorporating a reflection session would ensure participants maximize benefits and learn about the influences of problem-solving style on group interaction. Recognizing strengths and challenges in the moment could help participants gain a deeper appreciation for the diversity of approaches. They may also better understand when they should volunteer to lead a task and when someone with an opposing problem-solving style should lead the task.

To develop a broader understanding of the results from this study, another study examining the relationships between a leader's effectiveness in consensus building and their cognitive styles quantitatively should be conducted. Factors that could be addressed are a leaders' comfort with ambiguity and predetermined concreteness of tasks. This would also be an opportunity to measure perceptions of followers to better understand leadership in the context of consensus building around ANR issues.

Recognizing the contentious nature of many ANR issues (Grudens-Schuck, 2003), engaging in consensus building activities will help prepare participants of AL programs for leadership positions by increasing their sensitivity to divergent viewpoints when working with advocates, adversaries, and decision makers. Since opinion leaders within the ANR industry often work against one another (Chiarelli et al., 2010), an increased understanding of how to reach consensus, and take in multiple perspectives when doing so, should result in proactive conversations that bridge difficult issues. As a result, the ANR industry can make steps towards developing an industry-wide voice when speaking with decision makers.

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Teacher Training and Student Learning Outcomes in Family and Consumer Sciences: A Mentoring and Co-teaching Case Study

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This qualitative study is a mentoring and co-teaching case study of a fashion merchandising course. It seeks to understand the impact of cross-disciplinary co-teaching on student learning and instructor training by utilizing the Collaborative Responsive Educational Mentoring Model (CREMM). The course documented in the study was taught as a cross-disciplinary effort to incorporate career, business, technical, cultural, and theoretical information. It was found that a formalized mentoring program, coupled with a co-teaching experience involving a professor and a graduate student in Family and Consumer Sciences (FACS) can effectively enhance educational learning outcomes. The study exemplifies how educators in FACS may benefit from utilizing CREMM to structure cross-disciplinary courses, manage time, and apply different teaching methods to best serve student needs.

Keywords: case study, mentoring, co-teaching, Family and Consumer Sciences (FACS), fashion merchandising, graduate students, cross-disciplinary teaching, reflections

Introduction

Mentoring and collaborative teaching experiences are vital to the success of future educators (Sachs, Fisher, & Cannon, 2011). Effective mentoring of graduate teaching assistants promotes the competence and development of future professors (Corbett & Paquette, 2011). Combining rigorous standards for education with teaching collaboration between faculty and graduate students can enhance the quality of education of undergraduate and graduate students alike and improve faculty success (Devlin-Scherer & Sardone, 2013). Co-teaching is also a significant step in strengthening graduate student training and the profession in general. Co-teaching experiences are especially beneficial when students in the classroom are exposed to diverse fields of cross-disciplinary knowledge.

In what follows, the authors describe the implementation and outcomes of a mentoring and co-teaching experience in fashion merchandising. The collaboration has revealed that the integration of fashion and cultural studies knowledge with business training and corporate work experiences is especially beneficial for the fashion merchandising field. Many students majoring

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or minoring in fashion merchandising seek to pursue careers in industry, entrepreneurship, and various auxiliary services, which require practical hands-on training along with diverse theoretical knowledge. Therefore, the authors' goal was to evaluate whether co-teaching through a formalized mentoring model that includes academic diversity (cross-disciplinary content) would benefit students and produce a helpful model.

An introductory fashion merchandising course was used for the experiment. The course is routinely taught by a senior faculty member without a teaching assistant and uses lectures as the main method for delivery of instruction. This specific course was chosen because of the broad and diverse knowledge fashion students need in a class that provides an overview of the fashion industry. In addition to increasing learning outcomes for students, the case study suggests that formal mentoring from experienced professors and co-teaching opportunities can better prepare graduate mentees for success in academia.

The self-study of the co-teaching experience of a professor mentoring a graduate student highlights instructor training success. The authors chose to analyze their experience through a case study because their focus was on a particular classroom setting in which students and researchers shared their experiences to produce a set of relevant findings gained through systematic data collection that included participant reflections, student evaluations, and analysis to support their claims (Feldman, 2003). A case study, as defined by Creswell (2009), is a strategy of inquiry that explores in-depth a program, activity, or process of one or more individuals. This case study was bounded by time (August 2012-December 2012) and place (a large university in the southeast). Although this study was conducted within the confines of a fashion merchandising course, it aims to promote formalized mentoring programs and co-teaching opportunities that connect Family and Consumer Sciences (FACS) with business and other related disciplines. Settles, Sherif-Trask, Liprie, Madey, and Koivunen (2002) explain that the "applied nature of family science makes it a fertile ground for illustrating new techniques that encompass both practical and theoretical components in the classroom" (p. 403). Therefore, the authors took advantage of their diverse professional backgrounds and incorporated into the collaboration both practical activities and theoretical information to study if this impacted student learning.

Literature Review

Mentoring and co-teaching are two models of collaboration. Both models can exist in educational settings either individually or in combination. Collaboration increases the likelihood of meeting the needs of students (Ferguson & Wilson, 2011). Traditionally, in higher education, instructors tend to collaborate on research, but teach by themselves (Ferguson & Wilson, 2011). However, in recent years, instructors have explored the benefits of collaborations in higher education teaching as well. This study defines collaboration as a process in which higher

education professionals on different levels of their career track work together towards common educational goals. Both co-teaching and mentoring were utilized in this study.

Co-teaching

Co-teaching is a common method of delivery of instruction and an effective technique to improve student learning in the classroom (Ferguson & Wilson, 2011). Co-teaching or collaborative teaching involves two or more teachers sharing the responsibility for delivering instruction to a group of learners (Chanmugam & Gerlach, 2013; Kariuki, 2013; Scruggs, Mastropieri, & McDuffie, 2007; Villa, Thousand, & Nevin, 2004). Although co-teaching is heavily researched in elementary and special education, the literature on co-teaching in higher education is limited (Chanmugam & Gerlach, 2013; Ferguson & Wilson, 2011; Kariuki, 2013). However, recently, Chanmugam and Gerlach (2013) have focused on the benefits of co-teaching in the development of future educators, while Wilson and Ferguson (2012) have studied co-teaching as a model for pre-service teachers. In addition, Gillespie and Israetel (2008) investigated co-teaching in situations where instructors merge their diverse knowledge in their areas of specialization. The findings of these studies showed that students responded positively to co-teaching and that collaborating instructors learned a great deal from each other. However, the studies also documented students' and instructors' struggles with issues of power, authority, and shared responsibility for the course. For example, students of a co-taught course in the study conducted by Dugan and Letterman (2008) expressed negative feelings in regards to course organization and communication with instructors, while the participating instructors expressed concern regarding the additional planning time required. At the same time, Dugan and Letterman's (2008) study also found that personal reflection was instrumental in improving the co-teaching experience and concluded that co-teaching was beneficial because it led to mastering new skills and facilitated collaborative learning.

Sachs et al. (2011) discuss the original models of co-teaching for large groups, developed by Friend and Cook in 2007. They found that there were three main types of higher education models utilized in large classes: One Teach/One Observe, One Teach/One Assist, and Team Teaching. The One Teach/One Observe model is the most often used and most passive model of teacher training. In the One Teach/One Assist model, one instructor manages the course instruction, while the other helps direct student attention or helps individual students. A benefit of the One Teach/One Assist model is that "each co-teacher can work from his/her own strengths as they showcase their personal insights to the class" (Vermette, Jones, & Jones, 2010, p. 53). Team Teaching, defined by Friend and Cook (2007), is the mutual engagement of both instructors with joint responsibility for delivering content to students (Sachs et al., 2011). Team Teaching offers the opportunity for one of the co-instructors to clarify information for students by using an instructional strategy that differs from the other instructor's style. For this study, the co-instructors chose to follow the Team Teaching model and utilized lecturing and active

learning methods of instruction. Lecturing is a form of teaching where the instructor verbally explains the course material to the students. In contrast, active learning engages students in thinking about the content through participation, peer tutoring, and group learning (McKeachie & Svinicki, 2006). Using active learning strategies in the classroom has been reported to result in higher-level student engagement with the material, more questions regarding course content, and students being drawn more deeply into the study of the material (McKeachie & Svinicki, 2006).

Mentoring

Mentoring, defined by Mertz (2004), is a hierarchical, but supportive work relationship based on intent and level of involvement (Sachs et al., 2011). Mentoring graduate students is especially important as they learn to transition from industry or graduate student status to academia. Corbett and Paquette (2011) advocate for mentoring because “graduate student teachers report that they have received inadequate mentoring and formal observations which negates their ability to improve interactions with undergraduate students or stimulate their professional growth” (p. 288). They also argue that successful mentoring experiences will likely increase the number of faculty members willing to mentor others in the future, which helps the cycle continue (Corbett & Paquette, 2011).

The components of a formalized mentoring program include mentor training, the establishment of specific goals, time devoted solely to mentoring and regular feedback sessions, practicum or internship experiences, formal or informal courses or workshop participation, tracking and data collection to assess outcomes, and surveys of mentees post-mentorship (Vega, Yglesias, & Murray, 2010). This case study utilized all of the above elements.

Significance of the Study

Teaching in collaborative settings increases graduate student (mentee) confidence in their abilities by having access to expertise and assistance from a more experienced co-teacher (Vermette et al., 2010). However, co-teaching and mentoring have been virtually unexplored in FACS literature, including fashion merchandising, where this study was conducted. In addition, “existing literature has not looked systematically at graduate student teachers as co-teachers with experienced faculty” (Henderson, 2010, p. 247) or how graduate student co-teachers have effectively enhanced student learning outcomes. Existing studies on co-teaching and mentoring have explored instructors of the same level teaching together (such as two doctoral students), co-teaching in graduate programs or elementary schools, but not in large undergraduate classes. In addition, these studies addressed only collaborations that utilized disciplinary expertise considered atypical in FACS education and gathered data over a short period of time. Therefore,

this semester-long study that interrogates a cross-disciplinary co-teaching experience in fashion merchandising seeks to fill the void in the literature.

Conceptual Model

Bryant-Shanklin and Brumage's (2011) Collaborative Responsive Education Mentoring Model (CREMM) was used to guide the study. CREMM is a systems theory model that posits changes in higher educational outcomes, including benefits to participating instructors and students, can be attained through faculty-to-student educator mentoring. CREMM is a recently-developed model that was adapted from Thousand and Villa's (1995) Managing Complex Change Model. The model advocates for a formalized mentoring model in universities and calls for a collaborative process of mentoring between faculty members and pre-service teacher candidates. CREMM has been especially recommended in situations when professional mentee scholars bring to the classroom nontraditional, nonresearch-related, or world, experiences. Bryant-Shanklin and Brumage (2011) summarize the essence of CREMM by stating: "Both faculty and teacher candidates can benefit from this model as they endeavor to complete research, teaching, and service activities [because] the model supports using the talents of both faculty mentors and mentees" (p. 49).

CREMM is recommended for use in higher education and includes three pillars: a mentor teacher/professor, a mentee scholar/student, and diverse academic knowledge base. The purpose of the collaboration is dedication to a common project or research. CREMM posits that growth or change in higher educational environment occurs when the three pillars are utilized in a formal mentoring process that incorporates feedback sessions.

The dynamics of CREMM include several perspectives of a successful mentoring relationship. First, the participants are expected to have a broad scope of knowledge. Second, all participants in the mentoring relationship are expected to grow from the experience. Third, faculty and mentee faculty, regardless of their position in academia, need to seek to expand their level of expertise in new content areas.

CREMM was originally developed to address the needs of faculty employed at teaching-intensive universities to assist faculty to transition to a more research-focused environment. The authors of this study postulate that CREMM, proven to increase research productivity and success, can also increase mentee success in teaching through a combination of mentoring and co-teaching as long as the three pillars of the model stated above are utilized.

This study discusses an application of CREMM and reports the findings from data collected during a semester-long co-teaching and mentoring experience. The goals of the experience were: (1) Improvement of student learning outcomes through exposure to co-teaching utilizing a cross

disciplinary approach; (2) Career development and increased knowledge of mentee scholar and mentor faculty; and (3) Advocacy of formal mentoring programs, especially in FACS where practical knowledge and emphasis on teaching have always been valued.

Research Questions

The following research questions framed the study:

1. Would a combined co-teaching and mentoring relationship structured to follow CREMM enhance learning outcomes of students?
2. Would a co-teaching and mentoring relationship structured to follow CREMM enhance the learning outcomes of both the mentor faculty and mentee scholar?
3. Can co-instructors (mentor and mentee) successfully plan course content, manage time, and resolve power and authority issues in a co-teaching and mentoring environment?
4. Would the co-instructors, based on the findings of the experiment, recommend advocating for formal mentoring programs in FACS?

Participants and Their Roles in Co-teaching

The participants in this study included: (1) a class of 45 undergraduate students; (2) a graduate student mentee [from now on co-instructor 1]; and (3) a faculty mentor [from now on co-instructor 2]. The students were all undergraduate students (mainly sophomores and juniors) enrolled in an Introduction to Fashion Merchandising class. Co-instructor 1 is a doctoral candidate with concentration in International Merchandising in the College of Family and Consumer Sciences. She has many years of retail and business experience, in addition to an academic background in business. She is also enrolled in the Interdisciplinary Certificate for University Teaching program. Enrollment in this program is considered a strength of the study because the coursework prepared co-instructor 1 to incorporate active learning techniques and implement technology-driven tasks in the class. Her mentor, co-instructor 2, is a tenured Associate Professor and fashion scholar at the same university. Co-instructor 2 is an experienced teacher of the course and a former international teacher trainer with an extensive social/psychological and cultural studies background. The differences in educator expertise, knowledge, and experience constitute academic diversity as required by CREMM.

The co-instructors decided to team teach by dividing responsibility for the course into segments. Co-instructor 2 was the main instructor for the first half of the course until the midterm exam to allow co-instructor 1 opportunity to become familiar with the class, required course materials, and existing lectures and to learn by observation. While co-instructor 2 was the official teacher of record for the class, co-instructor 1 had substantial decision-making power regarding changes to course content, methods of course delivery, and issue resolution with students. Co-instructor

I was able to revise the syllabus prior to the class and develop new projects and learning activities. Despite this, constant revisions to the course throughout the semester were necessary. Co-instructor 1 also graded all assignments and exams and was the main instructor for the second half of the semester. Sachs et al. (2011) reintroduce Lortie's argument from 1975 regarding teaching apprenticeships and state that this set up is beneficial since pre-service teachers learn by apprenticeship of both observation and engagement. Because both instructors were active participants of the experiment, they attended every class.

The various roles of the co-instructors in the project followed known teacher education models discussed above: One Teach/One Observe, One Teach/One Assist, and Team Teaching. For One Teach/One Observe, the co-instructors took turns, and while one instructor managed the overall class instruction, the other observed the whole class or small groups to gain important information on the students. Although the One Teach/One Assist model was not used often, it was helpful at times when one of the co-instructors interjected experiences from a business perspective or refocused attention on the cross-disciplinary nature of topics covered. The overriding primary model used for the course was Team Teaching.

Methodology

Data Collection Method: Co-instructors

The authors implemented three qualitative data collection methods: (1) logbook documentation and reflection; (2) undergraduate student evaluations; and (3) undergraduate student surveys. Triangulation of the data from the three sources was done to support the credibility of the findings (Lincoln & Guba, 1986).

Glesne (2006) and Patton (2002) support the use of qualitative methods for case studies. This case study utilized both co-instructors as research instruments. Consequently, as recommended by Patton (2002), they were fully involved and immersed in the study. As a naturalistic inquiry approach, the study was designed to understand and capture the points of view of other people, as well as in this case, those of undergraduate students. The research took place in a real-world setting, which allowed lived experiences to unfold naturally throughout the semester.

The mentee/co-instructor 1 collected data in a semester-long logbook by keeping a dated and detailed written record of the work during the semester. Notes were taken on all weekly mentoring activities, discussions, notable events, and exchanges with students. The mentor/co-instructor 2 and the mentee/co-instructor 1 met three times per week for a minimum of one hour to discuss the class, assignments, and issues with students. The logbook was used as a research tool to reflect upon what was or was not working in the mentoring process and where the authors struggled to meet their goals. The co-instructors' time together was also used as debriefing

sessions of what they learned from peer observation, which is a technique that Chanmugam and Gerlach (2013) argue has a positive influence on co-teachers' personal and professional development. They state, "ongoing debriefing and shared reflection are essential" (Chanmugam & Gerlach, 2013, p. 115). The authors also chose this data collection method because documenting and reflecting allows researchers to become "a human instrument" (Lincoln & Guba, 1985) through building on previous knowledge and newly-learned lessons. Additionally, the authors used this method because Ferguson and Wilson (2011) have successfully utilized professor journals as data sources for documenting co-teaching in higher education.

Data Collection Method: Undergraduate Students

At the end of the semester, the undergraduate students were asked to provide feedback about their perceptions of the mentoring/co-teaching environment and their learning outcomes by completing an open-ended questionnaire. The questionnaire was IRB-approved and only given to students after receiving their consent to participate in the study. Participating undergraduate students received extra credit. If they declined to participate, they had a chance to earn extra credit in another way. Two students declined participation in the study. Out of 43 participating undergraduate students, this course was the first time 33 of them had participated in a co-taught course. Students were asked ten questions about their experiences in the co-taught course.

Besides the questionnaire, the undergraduate students also completed course evaluations, a separate departmental instrument, which was altered to include open-ended questions addressing the performance of co-instructor 1 and the co-teaching environment. They explained the strengths and weaknesses of the co-instructors in their narrative responses. The co-instructors asked a graduate student not involved in the research to administer and collect the anonymous surveys to eliminate bias. The undergraduate students were told that their participation was voluntary, and no identifier information was given to the instructors.

Data Analysis

Data analysis took place by using a grounded theory approach and utilizing the constant comparative method (Lincoln & Guba, 1985). Narratives from surveys and evaluations were read and reread, highly repetitive quotes and phrases highlighted and separated into groups by codes where themes emerged. Negative cases were also noted and highlighted for potential revision of the emergent themes.

As the human instruments in this study, the co-instructors also collected data in the form of logbook notes. The logbook documented issues and discussions, memories, thoughts, and feelings. Logbook data were analyzed by both co-instructors and summarized in the form of written reflections. Ortlipp (2008) stated, "A reflexive approach to the research process is

widely accepted in much of qualitative research” (p. 1). Reflections of participants have also been used to discuss and analyze data in other qualitative studies, including Devlin-Scherer and Sardone (2013) and Silva, Correia, and Pardo-Ballester (2010). In addition, Chanmugam and Gerlach (2013) emphasized that research participants “learned about their strengths and weaknesses through their own reflective processes” (p. 114). The co-instructors’ reflections mostly addressed the second research question regarding enhanced learning of faculty in a formal co-teaching and mentoring process. The authors discuss the data which highlight the successes and challenges of the mentoring and co-teaching process, lessons learned, and implications for future co-taught courses in FACS in the following sections.

Results

Undergraduate Student Feedback: Survey Questionnaire and Course Evaluation on Co-teaching

The data extracted from the undergraduate student questionnaire aimed to address the first research question concerning student learning in a co-teaching environment, structured according to CREMM. Several themes emerged from the questionnaire data—both positive and negative. Positive themes stated to impact student learning included establishment and demonstration of respect between the co-instructors, higher level of responsibility for course management for co-instructor 1 than generally expected of a teaching assistant, benefits of having two instructors with different sets of expertise, increased competence and knowledge of the field of fashion merchandising, and more access to instructors.

Among the strengths most highly rated by students were the different skills sets the instructors brought to the course and the way the instructors complemented each other. One student summarized what several students reported by stating, “[One instructor’s] strength was explaining [course content] in an interactive way so we could apply what we learned, the other’s was her first hand knowledge and experience of international culture and fashion.”

Data from the questionnaires also addressed the third research question regarding the success of a co-taught course, enhanced by a mentoring relationship. The majority of students felt the co-instructors were able to share power within the course, although some preferred the (mentor) professor to have more power over test preparation and grading. The student responses made it clear that students originally expected the mentor and mentee instructors to have different levels of power in the classroom and with grading. While one student wrote that “co-instructor 2 always treated co-instructor 1 as an equal,” another student noted that “ultimate authority was ambiguous, which sometimes made it difficult to know exactly what was expected.”

The majority of the undergraduate students benefited from the different pedagogical techniques that having two instructors brought to the class. Co-instructor 1 focused on active learning lesson plans, which include the 4 C's of 21st Century learning: Collaboration, Communication, Critical Thinking, and Creativity (Partnership for 21st Century Skills, 2011). Students appreciated this, as evidenced by statements, such as "I liked the interaction with classmates" or "I feel like [active learning] increases my learning and keeps me interested in the topic of discussion." Another student emphasized that "it kept me involved and the goals and certain opportunities motivated me." In addition, one of the students noted, "the dynamism of co-instructor 1 added excitement and new ideas" to routine lecturing that characterizes instruction in large undergraduate classes.

In the survey questionnaire, undergraduate students also communicated negative thoughts about co-teaching, the course, and class environment. The themes that emerged included feelings of confusion about what to expect on the test from the different types of teaching methods or instructors, frequent changes that occurred in the syllabus that affected class schedule, lack of time to cover all parts of the course book, and the difference in the speed of covering the material from one instructor to the other. Students also noted general problems with note-taking and having in-class assignments for which they had been required to read prior to class. Although most of these issues were expected by both co-instructors as this was a course that incorporated many changes and was co-taught for the first time, they offer important points for future co-teaching partnerships, especially when the collaborators are in the planning stages of course design. The negative themes also suggest new questions for future research, such as how to communicate and create proper assessments from different co-teaching styles and how teachers can effectively assume duties of planning a course to provide seamless instructional environment in terms of speed and material covered. The authors found that the official course evaluations contained similar themes and corroborated evidence from the student questionnaires.

Results from Logbook: Mentoring

Thematic data also emerged from analyzing the logbook for the semester. The themes that emerged addressed the third research question: departmental, classroom management, student, grading/testing issues, and general professional advisement. Departmental issues included focus on extraneous issues within the mentoring relationship that were separate from course content and delivery issues. Classroom management included issues of time, power, balance of work load, and the pace of covering material by different instructors. The student category included items such as tardiness, late assignments, ignoring classroom rules, and resolving student complaints related to group work. Grading and testing issues included the number of students who desired to resolve or seek further clarification on a particular grade, assignment, or test question. All other specific tasks were categorized as general professional advisement from mentor to mentee and included feedback on teaching, assessment and evaluation techniques, and

assistance with research-related issues. It was apparent from the logbook that a great deal of time was needed to collaborate outside of class to provide students with an environment where expectations were clearly understood.

The majority of time in the co-teaching and mentoring process during the semester was spent resolving grading and testing issues. Students tended to link the co-instructors' backgrounds and teaching style to assuming that the exams would challenge them in different areas. This prompted the authors to realize that it was essential that students clearly understood that assessments were linked to learning objectives and class activities and *not* to a particular instructor, her expertise, or her teaching style.

Reflection I: Mentee /Co-instructor 1

“The opportunity to grow into the role of instructor is an essential part of a fine graduate program” (Settles et al., 2002, p. 423). As the mentee in this case study and a doctoral candidate, I wholeheartedly agree with this statement because I have found mentor guidance, co-teaching and practice teaching to be the most valuable experience in my journey at the university. Participating in a semester-long process enhanced my learning and helped me formulate my answer to the second research question.

The learning outcomes that I have gained were nonrepetitive of what I had already mastered in industry and in lower-level degree programs. In fact, the opportunity to co-teach a class provided me with the comfort level to lecture and expand into other teaching techniques that suit my personality and educational philosophy. This experience allowed me to become confident in decision-making prior to teaching individually. It also provided an opportunity for my students to recognize and comment on my abilities, which allowed my own teaching style to emerge.

I learned that team teaching was an effective method of co-teaching because it offered the opportunity to instruct individually with the reinforcement and perspective of another instructor. I also discovered that students learn best when a variety of teaching techniques are employed. The diversity of teaching methods noticeably increased the level of student learning and engagement in the course as evidenced by student interaction during office hours, logbook notes, and student evaluations. At the same time, I became aware that implementing team teaching significantly affects time management, evaluations, course structure, and impacts power and authority relations between instructors.

After reflecting on the course, I realized that a co-teaching experiment can only be successful if proper amount of time is allowed for planning and implementation. In addition, if the co-teaching experience is coupled with mentoring, the experience will become even richer, which relates to the fourth research question of the study. The mentoring experience allowed me to

grow as a teacher in terms of course development and classroom maintenance. It also taught me how to successfully collaborate with another educator. The experience made a positive impact on my career growth and professional development because my mentor effectively provided me with models, feedback, and experiences that have helped prepare me to teach future courses independently and with full authority.

Reflection II: Mentor/Co-instructor 2

The professional relationship that was established for this study fostered an environment in which the co-instructors both could learn from each other and grow as educators. Besides having a highly motivated and committed mentee, several of my early decisions have helped make our partnership successful. These included supporting my mentee to recognize her individual strengths and unique knowledge and build upon it. An important aspect of our collaboration was to provide a platform for my mentee to become a self-confident educator. I made it clear that I considered our co-teaching experience an equal partnership and mutual learning exercise.

To mitigate power imbalances, I involved my mentee in every aspect of the course: planning; classroom delivery and management; the creation of course materials, lecture slides, and tests; as well as grading. We were brainstorming and problem-solving together, and she was also involved in conflict resolution with students. To build trust and ensure equality in our collaboration, I asked her to provide me with feedback on my teaching, existing course materials, and techniques. I underlined that I was open to changes; in fact, I was seeking them so that I could benefit from a different perspective. This give-and-take made our collaboration as dynamic and mutually beneficial as it can be in a formalized mentor-mentee relationship.

Our partnership has helped me grow as a faculty member. It allowed me to hone my management and interpersonal skills and helped me update my teaching strategies. I profited from my mentee's up-to-date knowledge of active learning strategies that she had acquired by participating in the Interdisciplinary Certificate for University Teaching training program. While my mentee was teaching, I was able to observe my students more closely than usual and scrutinize their reactions to different forms of learning. I realized that my teaching style, which is characterized by a preference for traditional lecturing, made my students somewhat passive and uninspired. In contrast, my co-instructor's active learning strategies made them involved and creative. My mentee's learning games and proclivity for teamwork resulted in more discussion among the students than in my classes where I generally end up as the main discussant and students talk to *me*, but not to one another. In sum, although this collaboration required considerable time commitment on my part, it was extremely beneficial professionally.

Discussion and Conclusions

The majority of the undergraduate students reported increased learning outcomes from the combination of experiences and diverse knowledge brought by the co-instructors. The undergraduate students disclosed that the cross-disciplinary nature of the course resulted in significant learning outcomes beyond those normally provided with one instructor or a class with a single focus. One aspect of teaching a fashion merchandising course is the global-, cultural-, political-, and career-oriented nature of the subject matter. This fosters an opportunity to partner with instructors from diverse backgrounds to provide students with the information needed to be successful in the global marketplace.

Feedback from the questionnaires and course evaluations, together with the authors' self-reflections indicate methods to successfully integrate a co-teaching practicum into the fashion merchandising discipline. The authors concluded that utilizing a cross-disciplinary curriculum and implementing multiple teaching styles within co-teaching produces positive learning outcomes for both students and instructors. These results concur with recent research on co-teaching in higher education (Chanmugam & Gerlach, 2013; Gillespie & Israetel, 2008; Wilson & Ferguson, 2012). In addition, data and the post-experiential reflections support a conclusion that the professional mentoring relationship not only improved instruction but also benefited both parties in terms of personal and professional development and increased their teaching competence. At the same time, it also had to be realized that the co-teaching experiment sometimes caused anxiety for the students, especially in the area of test preparation. Student responses made it clear that when power relations between mentor and mentee are not entirely clear, students become easily confused about what to expect. This concurs with the findings of other studies that also documented the challenges of power sharing and its impact on students (Chanmugam & Gerlach, 2013; Ferguson & Wilson, 2011; Kariuki, 2013; Waters & Burcroff, 2007).

The authors found that both lecturing and active learning techniques were enjoyed by different sets of students. At the same time, data also exposed that incorporating both provided the most optimal learning opportunities for the students. Because the co-instructors were able to create a sense of "fun" by implementing active learning strategies in the classroom, they were successful in reducing the stress level of students not accustomed to co-teaching. However, in order to achieve such results, significant and ongoing planning and adjustments were necessary (Waters & Burcroff, 2007), which required a lot of flexibility.

CREMM provided structure and guidance for the study. The data suggest that CREMM is a useful tool for facilitating changes in higher educational learning outcomes for instructors and students alike through faculty-to-student/professional educator mentoring in FACS. These findings concur with those of Ferguson and Wilson (2011) who stated that pre-service teachers

need to be exposed to a model of collaboration that provides professional support and learning. The case study revealed that a co-teaching experience, incorporating the three pillars of CREMM, is an effective way to increase learning outcomes. In addition, the authors were able to establish that CREMM is enhanced through a formalized mentoring relationship.

Johnson, Yust, and Fritchie (2001) studied views on mentoring in a Clothing and Textile Department and found that mentoring relationships were important and beneficial. Despite this, they concluded that institutions were not establishing such relationships because of lack of resources and departmental and bureaucratic obstacles. The authors hope that the following recommendations can be helpful in removing some of those barriers.

Recommendations

- Find a model of a formalized mentoring and/or co-teaching program and implement it at your department to provide a cross-disciplinary experience to students through partnering faculty with graduate students who have related, but different, backgrounds.
- View the diverse and broad array of knowledge that the co-instructors bring to the classroom as an asset.
- Work at the departmental level to increase funding, motivation, structure, and awareness of the benefits of collaboration and co-teaching within a formal mentoring environment.
- Provide ample time for the co-instructors to plan the course jointly because the design for a co-taught course is a complex process of collaboration and negotiation that needs to result in a seamless flow for the students.
- Incorporate several teaching techniques into your lesson plans, but remain true to your teaching style to model and foster authentic knowledge.
- Provide a high level of communication to students at the beginning of the semester regarding both instructors' expectations for testing, grading, and the level at which students are expected to perform and master course material.
- Make sure the students understand that teaching styles and instructional activities do not depend on individual instructors, but on the instructional goals of the course.
- Ensure that co-teachers are able to meet frequently because the smoothness of the relationship between the instructors impacts students' perception of power, authority, approachability, respect, and comfort with the instructors, as well as how students view the relationship between the instructors.

The above recommendations are meant to provide a model for collaboration as we work to train future faculty and provide interdisciplinary education to FACS students.

Limitations of the Study

Although this case study adds to the literature on mentoring and co-teaching in FACS, it has limitations. One limitation may be that the study included both instructor and student learning outcomes. Future research may require separating instructor learning outcomes from those of students and creating multiple case studies from the data. However, Patton (2002) noted that although case studies are expected to capture the complexity of a single case, a case study may be made up of several smaller case studies “layered or nested within the overall case approach” (p. 298).

Another limitation may be the obvious subjectivity of the co-instructors. Although the authors were careful to consider and report negative themes from the students’ viewpoint, they acknowledge that they were not able to fully remove themselves from the case as researchers. However, despite their insider status within the study, they have made every effort to make their thought processes transparent through their reflections.

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From Research to Practice: Increasing Ability of Practitioners to Relate Family-of-Origin Communicative Techniques to Current Marital Satisfaction

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Research has shown a connection between family-of-origin communicative techniques and later marital satisfaction. However, little has been done to see how this information can be incorporated in family life education settings. The purpose of this study is to make a connection between research and practice by testing the validity of easy-to-use measurements informing this relationship. The results of a survey from 649 married individuals about the communicative practices within their family-of-origin and in their current marriage support the ability of practitioners to understand techniques utilized in marriage by interpreting those used in childhood. By associating the literature between family-of-origin communication and marital dynamics in a practical way, practitioners and educators will be better able to assess and assist married couples in therapeutic or educational settings.

Keywords: family-of-origin communication, marital communication, family life education

Introduction

Family researchers have established a strong link between marital communication skills and marital satisfaction (Ledermann, Bodenmann, Rudaz, & Bradbury, 2010; Schoebi, Karney, & Bradbury, 2012). Communication patterns have been found to be a robust predictor of marital outcomes (Rogge, Bradbury, Hahlweg, Engl, & Thurmaier, 2006), a mediator of stress in marital relationships (Ledermann et al., 2010), and a factor in relationship violence (Cornelius, Shorey, & Beebe, 2010). However, the bulk of this research explored the dynamics within the current couple dyad, and only recently have researchers begun to turn their attention to partners' families-of-origin and how communication patterns and other relationship dynamics may have been learned and transmitted intergenerationally (Gardner, Busby, Burr, & Lyon, 2011; Strait,

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Sandberg, Larson, & Harper, 2015). Existing research suggests that both problematic and effective communication patterns in current romantic relationships may have their roots in family-of-origin interactions (Dennison, Koerner, & Segrin, 2014). Establishing a link between communication patterns modeled and learned within a person's family-of-origin and communication patterns practiced within the same person's current relationship has important implications for family educators in a variety of ways. For example, it aids in the identification of couples that may be at risk for marital dissolution through identifying communication patterns in the partners' families-of-origin. In addition, understanding family-of-origin communication dynamics suggests avenues of intervention in offspring's current relationships. Finally, such a link has potential for informing parenting practices. By identifying communication patterns within the home and adjusting accordingly, parents can increase the likelihood that their offspring will have more effective relationship dynamics and satisfaction.

In an effort to add to this body of literature, the current study explored the association between couples' present-day marital satisfaction and their family-of-origin communication styles by showing how this information can be used in a practitioner setting. Our purpose is to make a connection between research and practice by testing the validity of easy-to-use measurements. By associating the literature between family-of-origin communication and current marital dynamics in a practical way, practitioners and educators will be better able to assess and assist married couples in therapeutic or educational settings. The following is a brief discussion of the evidence for the impact of the dynamics within an individual's family-of-origin on his or her current couples' communication patterns followed by an explanation of the family communication theory underlying the Revised Family Communication Patterns Scale (Ritchie & Fitzpatrick, 1990).

Impact of Family-of-Origin on Present-Day Romantic Relationships

Family science scholars have long held the belief that the family is the primary socialization agent for how children manage future interactions (Berns, 2013) and that family-of-origin dynamics will influence offspring's individual and future family development (Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2011; Masarik et al., 2013). Research supporting these views suggests that early adult romantic relationships show evidence of intergenerational transmission of communication patterns and other relationship dynamics. For example, Story, Karney, Lawrence, and Bradbury (2004) found support for the idea that family-of-origin experiences shape interpersonal skills and behaviors in offspring in their study of 60 newlywed couples. The husbands in the sample who reported experiencing negativity in their families-of-origin were more likely to exhibit anger and contempt in their newlywed marital interactions (Story et al., 2004). In addition, the wives in the sample who reported a parental divorce also reported increased levels of psychological and physical aggression in their current relationship. Dennison et al. (2014) also examined the influence of family-of-origin characteristics on marital

satisfaction in newlyweds. The researchers found a strong correlation between such family-of-origin characteristics as parental divorce and interpersonal conflict with marital satisfaction for the wives in the study (Dennison et al., 2014). Conflict resolution styles in families-of-origin for both husbands and wives were associated with their conflict resolution styles in their current relationships (Dennison et al., 2014).

Although the literature establishes a connection, the translation between research and practice remains unclear. The ability of practitioners to further their understanding of current marital quality by interpreting family-of-origin communication relies heavily on a tool that easily measures the communicative techniques used while also acknowledging demographic factors that surround clients/students. The argument of the impact of family structure is one such justification that is commonly used in both therapy and family life education as a reason for research not being applicable to the student or client's personal life (Harris, 2013; Locke & Bailey, 2014).

Family-of-origin structure. Family-of-origin structure (e.g., single parent, stepparent, two-parent) has been linked with a number of offspring outcomes, including educational achievement (Baker, 2011; Björklund, Ginther, & Sundström, 2007), adolescent and premarital pregnancies (Powers, 2005), reproductive strategies (Sheppard, Garcia, & Sears, 2014), health issues (Ziol-Guest & Dunifon, 2014), psychosocial challenges (Wu, Hou, & Schimmele, 2008), entry into the labor force (Aquilino, 1996), and earnings (Björklund et al., 2007). Researchers have also speculated that family structure has an impact on an offspring's relationship outcomes, and the body of literature on divorce appears to support this link. For instance, Wolfinger (2003) found that marriages were almost twice as likely to fail if one partner had experienced a parental divorce and three times more likely to fail if both partners had experienced a parental divorce. These are particularly concerning statistics since the researcher also found that children of divorced families often marry each other. In another notable study, Amato and DeBoer (2001)—using data from a 17-year longitudinal study of marital instability—controlled for other possible contributing variables and concluded that offspring divorce is more strongly associated with the actual termination of the parental marriage than with any other factors.

The link established by researchers between marital satisfaction and communication processes has led many clinicians and educators to focus predominantly on intervening in current interactions between partners. Although this practice has demonstrated success (Markman, Stanley, & Blumberg, 2010), the above discussion suggests additional avenues for research that can inform both intervention and education for current couples with diverse family-of-origin structures, as well as provide a focus for current parental communication practices that could impact future relationships. Continuing research is needed to identify the dynamics in families-of-origin that specifically impact subsequent offspring relationships in a timely manner suited for

those practicing therapy or educating the community. The following is a brief discussion of a family communication model and measurement that could prove useful in achieving this goal.

Family Communication Patterns

Built upon the research of McLeod and Chaffee (1972), Fitzpatrick and Ritchie (1994) developed the Family Communication Patterns model, proposing that family communication is “the result of cognitive processes that are determined by family relationship schemas” (p. 87). The Family Communication Patterns model draws on two basic conceptualizations. *Conversation orientation* refers to the degree that the family emphasizes and cultivates a positive atmosphere for independent exchanges of feelings and ideas. Families who score high on this dimension typically spend a lot of time in interactions with each other and share their thoughts and feelings. The associated beliefs are that open and frequent communication is essential to a rewarding family life as well as the primary vehicle for educating and socializing the young. Families scoring low on conversation orientation interact with each other less frequently, and there is less exchange of ideas, thoughts, and feelings. Children are consulted less on family decisions or activities, and open communication is not viewed as necessary for education and socialization of the young. *Conformity orientation* focuses on the use of communicative techniques to maintain a homogenous atmosphere of views, rules, and behaviors (Fitzpatrick & Ritchie, 1994; Ritchie & Fitzpatrick, 1990). Those families scoring high in this dimension value harmony, conflict avoidance, and the interdependence of family members. Obedience to parents and other adults is valued, the families tend to be more traditional, and family members are expected to subordinate personal interests to the family interests. Families that score low in this dimension focus more on heterogeneous beliefs, individuality, and independence. Hierarchy is more flattened, and children are often involved in the family’s decisions with family interests being subordinated to personal interests.

According to Koerner and Fitzpatrick (2002), the conversation and conformity dimensions interact with one another to form four family types: consensual, pluralistic, protective, and laissez-faire (see Table 1). Consensual and pluralistic families are both high on conversation orientation but are high and low on conformity orientation, respectively. Protective families are low on conversation orientation and high on conformity orientation, while laissez-faire families are low on both conversation and conformity orientations. Laissez-faire families tend to promote conformity, which results in low levels of conflict and an increase in skills to maintain satisfaction within the family. Conversely, pluralistic families do not conform to the guardian’s views and openly communicate when disagreement does occur. Finally, consensuels are more likely to thrive on conflict and independence, while protective families promote agreement within the family unit and communicate less often.

Table 1. Visual Depiction of Fitzpatrick's Typologies

	High Conversation	Low Conversation
High Conformity	<i>Consensual</i>	<i>Protective</i>
Low Conformity	<i>Pluralistic</i>	<i>Laissez-Faire</i>

Research utilizing the Family Communication Pattern model and these typologies is widespread and includes such topics as conflict (Dumlao & Botta, 2000; Koerner & Fitzpatrick, 1997), family ritualizing (Baxter & Clark, 1996), effect on children's attitudes (Booth-Butterfield & Sidelinger, 1998; Koerner & Fitzpatrick, 1997), communication competence (Koesten & Anderson, 2004), reticence (Kelly et al., 2002), and family cohesiveness (Schrodt, 2009). However, few studies have investigated the potential of this measurement to be used in understanding the impact of family-of-origin communication patterns on current romantic relationships.

To our knowledge, the current study is the first attempt to establish a link between Fitzpatrick and Ritchie's (1994) family communication patterns in family-of-origin and present-day marital satisfaction. This connection is particularly concerning due to the suitability of this measurement to family life education settings and the robust research supporting a need for understanding family-of-origin communication when teaching about marital and parental techniques. The study's first hypothesis was generated based on the fact that a positive association has been established between effective communication skills and relationship satisfaction (Miller & Kanae, 1999; Sprecher, Metts, Burleson, Hatfield, & Thompson, 1995), and existing research—though sparse—has identified that high conversation orientation in family-of-origin is associated with increased ability to use communication skills in current relationships (Koesten, 2004). Therefore, we hypothesized that participants in the current study that reported higher levels of conversation orientation in family-of-origin would also report higher levels of relationship satisfaction:

H1: High conversation orientation in family-of-origin is positively related with current marital satisfaction.

In a similar vein, high levels of conformity orientation in family-of-origin have been associated to negative behaviors during conflict, including verbal aggression (Koerner & Fitzpatrick, 2002). Since negative communication behaviors have been linked to poorer marital outcomes (Carrère, Buehlman, Gottman, Coan, & Ruckstuhl, 2000), we anticipated that participants reporting high levels of conformity orientation in their families-of-origin would report lower levels of relationship satisfaction, resulting in the following hypothesis:

H2: High conformity orientation in family-of-origin is negatively related with current marital satisfaction.

Finally, although the literature on divorce in family-of-origin indicates that offspring's relational skills are negatively impacted, Amato and DeBoer (2001) were also able to determine that the negative communication practices in the families-of-origin is more the predictor of relationship instability than the structure of the family (i.e., divorced household). This finding, coupled with the sparseness of research on family structure and relationship satisfaction, led us to speculate that family structure would impact family-of-origin communicative techniques but not the ability of family communication patterns to predict offspring relationship satisfaction, resulting in the following hypotheses:

H3: Conversation and conformity orientation will vary based on structure of family-of-origin.

H4: Current relationship satisfaction will vary based on family-of-origin type.

H5: Current relationship satisfaction will not vary based on structure of family-of-origin.

H6: Conversation orientation in family-of-origin will predict current relationship satisfaction regardless of family structure.

H7: Conformity orientation in family-of-origin will predict current relationship satisfaction regardless of family structure.

Method

Procedure

A survey was mailed to 300 individuals in randomly-selected households from two large urban populations in a southeastern state. The survey design followed the procedure suggested by Dillman, Smyth, and Christian (2009) of three mailings (i.e., pre-notice, instructional, and follow-up letter). The contact information was obtained from the United Postal Services and only included known individuals who were over the age of eighteen and lived in a household with an opposite gender partner; this was an attempt to increase the likelihood of contacting those that qualified for the study. Regardless, only those who were married and an adult could complete the questionnaire. No additional restrictions were placed on respondents based on their race, gender, or age. The response rate was lower than expected (13%), so additional recruitment was done by (1) sending a link to the survey to all Directors of Graduate Studies at a southeastern college requesting that they forward it to their students and (2) creating an event on an online social networking site inviting members to take the survey. Comparisons were made among the three recruitment techniques, and no significant differences were found.

Sample

The three sampling techniques (i.e., mail, email, and social networking site) resulted in 649 individuals who were currently married. Of those participants, 66 (10.1%) had been married

before with a majority (83.1%) of those on their second marriages. The average length of time that the participants stated knowing their current spouse was a little under 15 years (*Min.* = 1.00 year; *Max.* = 46.00 years; *SD* = 10.10 years), while the mean for being married was almost 11 years (*Min.* = 1.00; *Max.* = 44.00; *SD* = 10.03). A small minority (.5%) noted that they were in an open marriage (e.g., swingers), while a few others (1.9%) stated that they were in same-sex relationships; the remaining participants categorized themselves as being in a heterosexual and monogamous relationship. A majority of the participants were female (72.2%) and Caucasian (91.9%). Almost equal representation was found among Asians (3.3%), African Americans (2.5%), Hispanics (1.5%), and Native Americans (1.5%). Multicultural (1.5%) and “Other” ethnicities (1.7%) were also presented as options, though it should be noted that the participants were able to select more than one category. The average age of the participants was 37.4 years with a minimum of 22 and a maximum of 57 years.

Participants were asked to identify the structure of their family-of-origin. A list was provided with eight options (e.g., mother and father, adopted parents) with the final choice being open-ended allowing the participants to describe their own family-of-origin. In particular, the following question was posed, “Please choose the description that best matches your guardian(s) while growing up. If your guardian(s) changed during your childhood, please choose the category that describes them for the majority of the time.” A majority of the participants grew up in a nuclear household ($n = 535$; 82.2%), followed by only living with a mother ($n = 51$, 8.1%) and living with a mother and stepfather ($n = 30$; 4.6%). The remaining 3% ($n = 22$) was distributed among other forms of family arrangements including father and stepmother, grandparents, father only, adopted parents, and extended family members.

Measures

Fitzpatrick’s family communication patterns. The only known study connecting Fitzpatrick’s family communication patterns to the use of conflict behaviors in adult romantic relationships (i.e., Koerner & Fitzpatrick, 2002) utilized the Revised Family Communication Patterns Scale (RFCPS; Ritchie & Fitzpatrick, 1990). Therefore, this study chose the RFCPS to measure participants’ perceptions of family communication norms rather than the lesser, though becoming more prominently, used Family Communication Environment Instrument (FCEI; Fitzpatrick & Ritchie, 1994; Schrodt, Witt, & Messersmith, 2008). Furthermore, the RFCPS was chosen over the original Family Communication Patterns Scale due to its better ability to “label and operationalize the underlying dimensions of conversation orientation and conformity orientation” (Koerner & Fitzpatrick, 2002, p. 42). Research supports the internal consistency and test-retest reliability of the scale with Cronbach’s alpha indicating a high internal consistency for both scales (conversation orientation = .92; conformity orientation = .82; Ritchie & Fitzpatrick, 1990).

In the current study, the online software collected the participants' response to the question about family-of-origin and used it within this measurement to make sure the family communicative techniques assessed were that of the family structure chosen. Example statements included, "In our family, we often talked about topics like politics and religion where some members disagreed with others" and "My [selected guardian] often asked my opinion when the family was talking about something." The questions were also randomized (i.e., always appearing in a different order) on the online questionnaire to increase validity of responses. Cronbach's alpha for the study was found to be even higher than previous studies with .95 for the subscale conversation orientation and .87 for conformity orientation.

Measure of relationship satisfaction. The Revised Dyadic Adjustment Scale (RDAS) was chosen over the Dyadic Adjustment Scale (DAS) because of its brevity (i.e., 18 fewer items than the original DAS, easier for practitioners to use), multidimensionality, and its ability to distinguish between distressed and nondistressed individuals and relationships (Busby, Christensen, Crane, & Larson, 1995). The RDAS consisted of 14 items that provided a total score (RDASTotal) and 3 subscores: dyadic consensus (consensus; measuring the degree to which couples agree on matters of importance to their relationship), dyadic satisfaction (satisfaction; measuring the degree to which couples are satisfied with their relationship), and dyadic cohesion (cohesion; measuring the degree of closeness and shared activities experienced by couples). Example questions included, "How often do you discuss or have you considered divorce, separation, or terminating your relationship?" and "Do you and your partner engage in outside interests together?" RDAS scores ranged from 0-48 with "distressed relation" having lower scores. The instrument has shown high internal consistency (Cronbach's alpha = 0.90) and construct validity (Busby et al., 1995). In the present study, the following Cronbach's alphas were found for both subscales and for the overall questionnaire: consensus = .77, satisfaction = .82, cohesion = .76, and RDASTotal = .87.

Results

The relationship between the conversation and conformity orientations (as measured by the RFCPS) and relationship satisfaction was investigated using Pearson product-moment correlation coefficients. Preliminary analysis was performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The total score for the RDAS, when compared to conversation orientation, resulted in a small, negative relationship ($r = -.23, p < .01$). Similar findings were found with the subscales consensus ($r = -.19, p < .01$) and cohesion ($r = -.20, p < .01$). However, the relationship between the subscale satisfaction and conversation was a large, positive relationship ($r = .87, p = .00$). Although variations were found by subscales, the data generally supported our H1 that conversation orientation in family-of-origin would be positively associated with marital satisfaction in offspring.

Conformity orientation also showed notable correlations with relationship satisfaction. Positive relationships were found with conformity and relationship satisfaction (RDASTotal; $r = .08$), though also weak. The subscales of RDAS showed similar findings (cohesion, $r = .075$; consensus, $r = .053$) except for satisfaction, which revealed a medium, negative relationship ($r = -.35, p < .01$). Our H2, predicting that there would be a negative correlation between a conformity orientation in family-of-origin and marital satisfaction, was also generally supported by our data.

In response to H3, a general analysis of the arrangement of the family-of-origin was done based on their type of family communication and current marital satisfaction (see Tables 2 and 3). Preliminary testing revealed no significant gender differences between stepparent and single parent arrangements (i.e., mother or father). In general, those raised in a mother and stepfather household were more likely to report high on the conversation orientation, followed by living with only a mother, both the mother and father, and other family arrangements. For conformity orientation, living only with the mother resulted in the highest averages, closely followed by both the mother and father, mother and stepfather, and other. The overall score of marital satisfaction was highest for those who grew up with both parents, followed by mother and stepfather, mother only, and other types of family arrangements. As noted in Table 3, further variations were found with the subscales.

Table 2. Family-of-Origin Communication in Different Structures of Family-of-Origin

Family Structures	Conversation Orientation			Conformity Orientation		
	<i>n</i>	<i>M (SD)</i>	95% CI	<i>n</i>	<i>M (SD)</i>	95% CI
Mother/Father	535	41.24(12.52)	[40.12, 42.36]	535	31.12(7.01)	[30.50, 31.75]
Mother only	51	42.71(16.08)	[38.18, 47.23]	51	31.59(9.27)	[28.98, 34.20]
Mother/Stepfather	30	43.34(11.06)	[39.14, 47.55]	30	30.66(6.40)	[28.22, 33.09]
Other	22	39.29(18.96)	[29.55, 49.04]	22	24.71(10.77)	[19.17, 30.24]

Table 3. Marital Satisfaction in Different Structures of Family-of-Origin

Family Structures	Consensus			Satisfaction	
	<i>n</i>	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI
Mother/Father	535	22.2(3.7)	[21.8, 22.5]	10.9(4.2)	[10.5, 11.3]
Mother only	51	21.4(4.3)	[20.2, 22.6]	10.6(5.2)	[9.1, 12.0]
Mother/Stepfather	30	21.4(4.5)	[19.7, 23.1]	11.2(4.6)	[9.5, 13.0]
Other	22	20.6(8.0)	[14.4, 26.7]	12.1(6.0)	[7.5, 16.7]

Family Structures	Cohesion			Total	
	<i>n</i>	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI
Mother/Father	535	13.5(2.4)	[13.3, 13.7]	55.3(6.8)	[54.7, 55.9]
Mother only	51	13.8(3.4)	[12.8, 14.7]	54.4(8.8)	[52.0, 56.9]
Mother/Stepfather	30	13.8(2.5)	[12.8, 14.8]	54.9(7.5)	[52.0, 57.7]
Other	22	13.0(3.2)	[10.5, 15.5]	52.1(7.1)	[39.0, 65.2]

The Mann-Whitney U Test was used to assess for differences between family-of-origin types and present-day relationship satisfaction (i.e., H4). No significant differences were found with consensual ($U = 24204$, $z = -.91$, $p = .36$) and laissez-faire ($U = 24751$, $z = -.21$, $p = .83$) family types. However, significant differences were found with the other two family types. Pluralistic families revealed a significantly higher score on relationship satisfaction ($U = 32579$, $z = -3.61$, $p = .00$) when compared to those that were not pluralistic ($Md = 57$, $n = 208$ versus $Md = 54$, $n = 379$). Similar results were found with protective families ($U = 32489$, $z = -4.30$, $p = .00$); those that qualified as the protective typology were more likely to score higher on relationship satisfaction than those that were not ($Md = 58$, $n = 226$ versus $Md = 55$, $n = 361$).

To assess H5, a one-way, between-groups analysis of variance was conducted to explore the impact of family-of-origin structures on marital satisfaction and family-of-origin communicative practices. Participants were divided into the four groups shown in Tables 2 and 3. There were no significant differences found at the $p < .05$ level in marital satisfaction or family-of-origin communicative practices for the four family types. Assessment of the homogeneity of variances showed concerns on each Levene's test with the exception of the RDAS subscales consensus ($p = .07$) and satisfaction ($p = .08$).

For H6 and H7, regression models were formed to assess the association of family-of-origin communication with relationship satisfaction regardless of family structure. The outcome variable for the regressions was relationship satisfaction (including subscales) with predictor variables family structure, conversation, and conformity. To completely understand the prediction ability, a hierarchical regression approach was taken with variables entered in the aforementioned order. Preliminary assumption testing was conducted with no serious violations noted.

For viewing the impact of the family-of-origin's arrangement on relationship satisfaction (see Table 4), family structure was entered in step 1, resulting in a slight increase of total variance explained by the model. In particular, 7% ($F = 22.14$, $p < .001$) of satisfaction was accounted for when including family arrangement. The total variance explained on relationship satisfaction and consensus was only 1% ($F = 3.70$, $p < .05$ and $F = 3.56$, $p < .05$, respectively), while cohesion did not increase at all.

To assess the connection between conversation and relationship satisfaction while controlling for family arrangement, the variable from Fitzpatrick's RFCPS was inserted into step 2. The subscale explained an additional 5% of the variance in total relationship satisfaction, after controlling for family structure ($R^2 = .06$, $F = 12.86$, $p < .001$). Conversation explained an additional 4% of the variance of the subscales cohesion and consensus, after controlling for family structure ($R^2 = .04$, $F = 8.53$, $p < .001$ and $R^2 = .05$, $F = 9.45$, $p < .001$, respectively). Finally, conversation described an additional 76% of the subscale satisfaction, after controlling

for family structure ($R^2 = .83$, $F = 1001.76$, $p < .001$). In the final models, conversation was found to be a statistically significant predictor ($p = .00$) of the RDAS scale and subscales. Family structure was also found to be a statistically significant predictor in each final model with the exception of the subscale cohesion ($p = .41$), with conversation recording a higher beta value ($\beta = .20$, $p < .00$) than family structure ($\beta = .03$, $p = .41$).

Table 4. Hierarchical Multiple Regression Analysis Predicting Relationship Satisfaction from Gender, Family Structure, and Family-of-Origin Conversation Patterns

Predictor	Relationship Satisfaction							
	RDAS		Cohesion		Consensus		Satisfaction	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
<i>Step 1</i>								
Family Structure	.01	-.09*	.00	.03	.01	.09*	.07	-.28**
<i>Step 2</i>								
Conversation	.06	.22**	.04	-.20**	.05	-.19**	.83	.88**

Note: * $p < .05$, ** $p < .001$

The final hypothesis was approached in a similar way as the previous. Family structure was entered in step 1, while Fitzpatrick's conformity was entered in step 2 (see Table 5). After the entry of Fitzpatrick's conformity techniques, two subscales showed an increase in total variance explained by the model as a whole: satisfaction ($\Delta R^2 = 9\%$, $F = 47.42$, $p < .001$) and cohesion ($\Delta R^2 = 3\%$, $F = 1.57$, $p = .20$). The overall score for marital satisfaction and consensus were less likely to be explained by Fitzpatrick's conformity variable ($\Delta R^2 = 1\%$ and 0% , respectively) when family structure was included. In the final model, family structure was a statistically significant contributor ($p < .05$) for all variables explaining relationship satisfaction except for the subscale cohesion ($p = .34$, $\beta = .03$). Conformity only showed to be a significant contributor to explaining relationship satisfaction in the subscale satisfaction ($p < .01$).

Table 5. Hierarchical Multiple Regression Analysis Predicting Relationship Satisfaction from Gender, Family Structure, and Family-of-Origin Conformity Patterns

Predictor	Relationship Satisfaction							
	RDAS		Cohesion		Consensus		Satisfaction	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
<i>Step 1</i>								
Family Structure	.01	-.10*	.00	-.04	.01	-.09*	.06	-.28**
<i>Step 2</i>								
Conformity	.02	-.18*	.00	.07	.01	.05*	.18	-.35**

Note: * $p < .05$, ** $p < .001$

Discussion

The results of this study lend support to the overall body of literature suggesting communication patterns are transmitted intergenerationally and family-of-origin communication does impact the relationship satisfaction of offspring (Andrews, Foster, Capaldi, & Hops, 2000; Sabatelli & Bartle-Haring, 2003; Story et al., 2004). For example, we found support for our first hypothesis that high conversation orientation in family-of-origin is positively related with offspring's marital satisfaction. This finding is not surprising given that individuals from families characterized by a high conversation orientation were socialized to value overall communication and spent time in their families-of-origin exchanging ideas and sharing thoughts and feelings. Since these are behaviors that have also been linked to marital satisfaction (Litzinger & Gordon, 2005; Rehman & Holtzworth-Munroe, 2006), persons practicing them could be expected to have greater levels of marital satisfaction. We also found support for our second hypothesis that high conformity orientation is negatively related with current marital satisfaction. Given that these individuals were socialized in families that valued harmony, avoided conflict, and placed personal needs below that of the family, these findings are also not surprising. Conflict avoidance and subjugation of personal needs have been associated with lower levels of marital satisfaction (Gottman, Gottman, & DeClaire, 2006; Olson, Olson-Sigg, & Larson, 2008), so it seems almost inevitable that these individuals will experience some level of dissatisfaction in their relationships.

Some of the results from the subscales of the RDAS used to measure relationship satisfaction were also predictable; however, some were not. For example, the finding that higher levels of conformity orientation were associated with lower scores on the dyadic satisfaction scales was consistent with hypothesis two. As stated above, communication patterns that result in conflict avoidance and denial of personal needs have been associated with lower levels of marital satisfaction in prior research (Gottman et al., 2006; Olson et al., 2008). The participants' patterns of dyadic consensus, or agreement about important issues, were also fairly predictable. For example, higher levels of conversation orientation were found to be negatively associated with dyadic consensus. Certainly, if couples feel free to air their independent ideas and thoughts—as those from a high conversation oriented family do—it is likely they also feel free to disagree. Therefore, agreement on important issues probably would not be as valued as it might be in couples who do not freely exchange contradictory thoughts or who may not feel they have the freedom to disagree. The finding that higher levels of conformity orientation in family-of-origin were linked to higher scores on dyadic consensus was supportive of this assumption, since these individuals were socialized in families that valued harmony and agreement.

Less predictable, however, was this study's findings on dyadic cohesion—or degree of closeness and shared experiences. Higher levels of conversation orientation in this study were negatively associated with dyadic cohesion, and higher levels of conformity orientation were positively

associated with dyadic cohesion. This relationship was further shown with variations in the four typologies: pluralistic (i.e., high on conversation and low on conformity) and protective (i.e., low on conversation and high on conformity) families scored higher on relationship satisfaction than those that were not. Although it might be speculated that being able to have a free exchange of thoughts, feelings, and ideas with a partner would lead to a sense of closeness, these findings suggest this may not be the case. The free exchange of thoughts and feelings did appear to lead to greater relationship satisfaction; however, it also appeared to lead to a sense of feeling less close to one's partner. Conversely, those with higher levels of conformity orientation reported higher levels of cohesion, or feeling close to their partners. Thus, partners may be engaged in a tradeoff between feeling close versus having more of a voice and individuality in the relationship.

However, if partners are sacrificing closeness for the ability to freely express thoughts and feelings and vice versa—as these findings suggest—this has direct implications for clinicians and educators. Targeting communication patterns in the current relationship is a common intervention in therapy and educational settings. By identifying the family communication pattern in the partners' families-of-origin, educators may be more focused on how they approach teaching communication skills. For example, although a high conversation orientation in families-of-origin indicates a free exchange of ideas, thoughts, and feelings, there is no indication that these thoughts and feelings are exchanged in an appropriate or relationship-building manner. For individuals from a high conversation orientation family, it may be salient to focus on how ideas and feelings are being conveyed, as well as on ways to reconnect after disagreements, techniques for repairing disruptions in the relationships, and emphasis on the importance of scheduling times to share being together in order to correct for the risk of reduced cohesion. For those individuals whose families were high conformity oriented, the challenge would be to retain that important sense of closeness in the relationship, while also increasing relationship satisfaction through more open communication. Educators may concentrate on helping the partners to improve direct communication of needs while also emphasizing that disagreements can occur without threatening the integrity of the relationship.

The findings that individuals from high conversation oriented families experience lower levels of dyadic consensus is less concerning; however, by providing partners with information that this pattern may be a byproduct of their more open approach to communication, clinicians and educators may be able to normalize, and thus lessen, the impact of lower consensus levels. Higher levels of consensus found in conformity oriented individuals are not problematic, but positive, and can be viewed as simply a characteristic of this pattern of family communication.

The other pattern that emerged from the data was the difference between the RDAS overall score and the subscale scores. For example, overall RDAS scores were negatively associated (albeit weakly) for individuals from high conversation oriented families and positively associated

(again, weakly) for those individuals from high conformity oriented households. Although this appears to be a contradiction, the lower scores for the consensus and cohesion subscales for conversation orientation and higher scores for consensus and cohesion subscales for conformity orientation undoubtedly accounted for the apparent contradiction between the overall dyadic adjustment scale scores and the relationship satisfaction subscale scores. However, for educators, the knowledge that this may be a consistent pattern for individuals who have these family communication patterns in their families-of-origin can help them to more accurately assess the strength of the relationship. It also underscores the need for clinicians and educators to view and interpret scores from the entire assessment tool before making conclusions.

Data indicated support for hypothesis three (i.e., conversation orientation and conformity orientation will vary based on the structure of the family-of-origin), and some interesting patterns emerged. For example, those growing up in a mother and stepfather household were more likely to use an open communication, high conversation oriented pattern, and those growing up in a mother-only family were highest in conformity orientation. Although caution should be exercised in drawing any conclusions, these findings do offer avenues of additional research and open up many questions. For example, if these findings were found to be consistent, what dynamics within the mother and stepfather configuration could explain the increased likelihood of a high conversation orientation? Since a mother-only home resulted in higher levels of conformity practices, and a mother and stepfather home probably spent some time as a mother-only home, what was it about the change in family structure that may have facilitated the change in family communication patterns? Does the need to recalibrate the family after the introduction of a new member into the spousal subsystem create an increased need for communication of thoughts and feelings that facilitates a conversation orientation?

In terms of implications, these findings add to the body of literature that indicates relationship patterns are established in families-of-origin and do have an impact on the quality of offspring's romantic relationships. Information drawn from this study's findings may be particularly useful to educators wanting to instill in parents the desire of increasing later relationship satisfaction in their children. The knowledge that fostering a high conversation orientation in their family in which open communication, free exchange of ideas, and expression of emotions are promoted could have the potential to yield results in future relationships may be of interest to them. Further drawing from these findings, clinicians and educators may want to inform parents that open communication may result in a sense of disconnection at times, and therefore, modeling relationship repair and intentional reconnection after disagreements may also be useful skills that could impact their children's future relational happiness.

This study does have limitations. Probably the most salient is that data were collected from individuals only as opposed to couples. Therefore, the researchers were unable to determine what the impact on relationship satisfaction would be for couples in which partners had different

family-of-origin family communication patterns. Future research would benefit from an exploration of how each partner's family-of-origin orientation would interact with the other partner's and impact the relationship satisfaction of each. Finally, as with all retrospective studies, the designation of conversation orientation or conformity orientation for participants' families-of-origin was based on participants self-report and experiences of several years prior to the study. As all participants were currently married, and therefore, not living in their family-of-origin, their responses to the RFCPS were, of necessity, based on their memory. Since current perceptions of past events are subject to reauthoring based on life experiences, and in this case, on the desire to view one's family-of-origin experiences as positive, care should be given to any interpretation of findings accordingly.

In conclusion, this study provided support for the idea that communication patterns are transmitted intergenerationally and that they can be measured and assessed in an educational setting. In addition, the study found that higher levels of conversation orientation in a participant's family-of-origin were positively linked to relationship satisfaction in his or her own marriage, and higher levels of conformity orientation in a participant's family-of-origin were negatively linked to relationship satisfaction in his or her own marriage. Patterns that emerged in scores of the RDAS subscales indicated avenues of intervention and education for couples, including an increased emphasis on relationship repair and reconnection. The ease of using the RFCPS and RDAS in educational and therapeutic settings should further the generalizability of these results.

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Reducing Youth Risk Behaviors Through Interactive Theater Intervention

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The reduction of risk behaviors in secondary schools is a key concern for parents, teachers, and school administrators. School is one of the primary contexts of socialization for young people; thus, the investment in school-based programs to reduce risk behaviors is essential. In this study, we report on youth who participated in an intervention designed to improve decision-making skills based on positive youth development approaches. We examine changes in decision-making skills before and after involvement in the Teen Interactive Theater Education (TITE) program and retrospective self-assessment of change in knowledge, abilities, and beliefs as a result of participating in TITE (n = 127). Youth that reported increases in knowledge, abilities, and beliefs due to the intervention (n = 89) were more likely to think about the consequences of their decisions and list options before making a decision compared to their counterparts that reported less overall learning (n = 38). Implications for intervention research and stakeholders are discussed.

Keywords: adolescence, decision-making, intervention, theater

It is well established that adolescence is a critical period for the development of decision-making skills (Albert & Steinberg, 2011). Physiological changes affect an individual's ability to perform complex cognitive tasks, including emotional regulation, delay of gratification, hypothetical reasoning, and decision-making (Churchwell & Yurgelun-Todd, 2013; Steinberg, 2005). These changes are linked to physical development, and studies have shown that environmental factors can play a mediating role in adolescent decision-making behavior (Pfeifer et al., 2011; Tuvblad et al., 2013). One such environmental factor is the availability of youth development programming.

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Several intervention strategies have been developed to aid youth in the development and exercise of better decision-making skills. A wide variety of programs that use different approaches have been applied broadly to address general skills and knowledge, and other programs target specific risk behaviors such as sexual activity and substance abuse (Robin et al., 2004). Not many scholars have been able to measure the effectiveness of these intervention strategies. The few that have evaluated the efficacy of the interventions found that focusing on practical examples of risk situations, reinforcing information in different ways, and catering to a variety of learning styles have been associated with success (Reyna & Farley, 2006). In this paper, our goal is to examine the effectiveness of one intervention (Teen Interactive Theater Education [TITE] program) that is youth-led and uses performing arts to educate about both risks and positive factors associated with adolescent development. We ask the following questions:

1. What are the implications of the TITE intervention on decision-making skills in general for participating youth?
2. Is there an association between self-reports of decision-making skills and self-assessment about participant's knowledge about the consequences of risk behaviors, their abilities to avoid risk behaviors, and the importance of their beliefs regarding risk behaviors?

Of the few evaluated interventions, only a small number have implemented drama and performing arts to deliver decision-making information to youth participants. TITE relies on dramatized performances, role-plays, and peer education (Kisiel et al., 2006; Sriranganathan et al., 2012) to better equip youth to make healthy decisions. In TITE, youth participants are given the opportunity to present information to their peers through educational performances. The TITE curriculum incorporates various experiential activities that engage youth in the development and delivery of original skits associated with risky behaviors. Initially, participants engage in activities to build trust and cooperation, followed by lessons on relationships, critical thinking, values, and life skills that culminate in a "performance" in which teens teach other teens about risk prevention. The program's objectives are to enhance youths' decision-making skills by increasing their knowledge of the consequences of risky behaviors, improving risk-avoidance skills, and changing beliefs about the importance of avoiding risky behaviors.

While programs have utilized a theatrical-based approach that is in part informed by psychology, there is a lack of formal program evaluation of these strategies (Glik, Nowak, Valente, Sapsis, & Martin, 2002). The combination of factors in TITE makes it a unique intervention approach from others (e.g., use of drama and performing arts, trust activities) in the literature and underscores the need to evaluate the effectiveness of such programs in reaching positive youth development outcomes (decision-making skills in this case). Through an evaluability assessment of 4-H Healthy Living programs, TITE was found to have preliminary evidence that it was ready

for a comprehensive outcome evaluation and/or replication at a national level (Downey, Peterson, Le Menestrel, Leatherman, & Lang, 2014).

In this study, we inquire whether TITE was successful in improving youths' decision-making skills. We use pre- and post-surveys to evaluate decision-making outcomes. Then, we compare decision-making outcomes of youth reporting higher levels of knowledge, abilities, and beliefs as a result of participating in TITE to the decision-making outcomes of youth who reported lower levels of those same constructs.

Method

The TITE program has been delivered at seven alternative high schools in a large urban area in the Southwestern United States. Students take an elective class involving 30 hours per semester, engaging in team-building activities and experiential learning opportunities that cover topics such as life skills, critical thinking, relationships, and values. As stipulated by the Institutional Review Board, all survey respondents assented to their participation and participants less than 18 years of age were required to obtain parent/guardian consent.

The TITE evaluation used a pre-/post-survey administered to all participants during the first session and then again during the last session. There were 58 items on the pre-survey instrument and 69 items on the post-survey instrument. In addition to basic demographic information (e.g., age, gender, race), youth reported on areas of self-efficacy, including decision-making abilities, control over goals, and interpersonal skills. The additional eleven items on the post-survey asked respondents to reflect on the status of their knowledge, abilities, and beliefs as a result of participating in TITE. For instance, participants were asked, "After participating in the TITE program..."

- My knowledge now about the risk of pregnancy is: *Less than what it was before TITE, About the same as what it was before TITE, or Greater than what it was before TITE.*
- My ability to resist negative peer pressure is: *Less than what it was before TITE, About the same as what it was before TITE, or Greater than what it was before TITE.*
- My belief in the importance of abstaining from sex until marriage is: *Less than what it was before TITE, About the same as what it was before TITE, or Greater than what it was before TITE.*

While we might anticipate self-reports on the level of knowledge, abilities, and beliefs to be greater as a result of participating in TITE, it is possible for youth to report decreases in these constructs. Although at first thought this may seem counterintuitive (how does one have less knowledge after participating in a program?), there are some possible explanations as to why someone might make that assessment. For instance, it could be that participants indeed felt that

they knew more before participating in TITE, but that their knowledge base had been disrupted, and they are confused as a result of their participation. Or it may be that long-held belief systems are being questioned and so some participants are re-examining those beliefs, but are temporarily at a loss until they can reconcile the new information with their long-held beliefs. Finally, it could be that some respondents were just feeling negatively about their experience in TITE and are reflecting that on their post-survey. We are unable to tease out precisely why participants responded in this manner, but it is important to know, from an evaluation standpoint, that some participants do not improve after participating in an intervention.

A total of 448 participants completed a pre-survey, and 368 completed both the pre- and post-surveys (82%) since TITE began in 2004 [For a description of the TITE curriculum and program, see McDonald, Williams, & Carter (2011)]. All participants included in the study completed both pre- and post-evaluations. The present study uses a subset of total respondents who participated in 2011, 2012, and 2013 ($n = 127$), as those years provided the most complete data set (As a result of focus group feedback pertaining to the instruments, some modifications had been made to the evaluation instrument prior to 2011). The scales used for these analyses include “decision-making” ($\alpha_{pre} = .65$; $\alpha_{post} = .72$) and what we have termed, for ease of reference, “overall learning” ($\alpha_{post} = .85$). Overall learning includes the participant’s assessment of knowledge, abilities, and beliefs as a result of participating in TITE. Of the respondents in this data set, slightly more than half were female (54%) and the vast majority (75%) were Hispanic. Ages ranged from 9 to 21 years, and the mean age was 15.8 years ($SD = 1.31$).

Plan of Analysis

Paired t -tests and logistic regression were employed using SPSS 22 (IBM Corp, 2013). We used paired t -tests to determine whether responses about decision-making significantly changed from before the intervention to after. Next, logistic regression was used to compare decision-making outcomes of youth. For the logistic regression, we used a dichotomized “overall learning” variable to represent two groups of participants: youth that reported more overall learning (knowledge, understanding, abilities; $n = 89$) as a result of participating in TITE, and youth that reported less overall learning ($n = 38$) as a result of participating in TITE. For purposes of the logistic regression analysis, we dichotomized the variable that asked participants the status of their knowledge, abilities, and beliefs as a result of participating in TITE (1 = *less than before*; 2 = *same as before*; 3 = *more than before*). We used a median split criteria, where we took the median value (1.66) of the mean of the 11 original variables and created a dichotomized “overall learning” variable. We used the response of *Learned Less than what it was before TITE* as the referent group in logistic regression analyses. We controlled for age as a potential confound to reports of development associated with the TITE program.

Results

Youth reported changes in decision-making skills in the desired direction after they participated in the intervention as compared to before participating. Of these changes, four were statistically significant: “It is important to: stick to my decisions, make good decisions, and be responsible for my decisions” and “I think about what might happen because of my decision” (see Table 1).

Table 1. Pre/Post Differences on TITE Evaluation Survey

Variable	Pre-Survey		Post Survey		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<i>It is important to...</i>					
stick to my decisions	2.51	0.05	2.66	0.05	-2.42**
make good decisions	2.47	0.05	2.61	0.05	-2.61**
be responsible for my decisions	2.69	0.05	2.78	0.05	-1.69*
<i>Some things about me...</i>					
I list my options before making a decision	1.96	0.07	2.02	0.06	-0.83
I think about what might happen because of my decision	2.28	0.06	2.44	0.05	-2.53*
After acting on my decision, I think about the results	2.39	0.06	2.32	0.07	0.90

Note: *** Denotes significance at $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Variables measured on a scale of 1 (*never*) to 3 (*all of the time*).

We next inquired as to what were the correlates of the efficacy of the TITE program. For example, do individuals reporting higher overall learning (concerning knowledge, abilities, and beliefs) as a result of the program also report improved decision-making skills? Compared to individuals who reported less overall learning after they participated in the intervention, those youth who reported more overall learning as a result of the intervention were also more likely to report better outcomes concerning decision-making (see Table 2). For instance, the odds that youth who reported more overall learning from the intervention would list their options before making a decision were 3.4 times greater than their counterparts who reported less overall learning. The odds that youth who reported more overall learning would think about what might happen to them because of their decision were 4.4 times higher than their counterparts who reported less overall learning. The odds that youth who reported more overall learning from TITE would also think about the results after acting on their decisions were 2.5 times higher compared to their counterparts who reported less overall learning. Last, the odds that youth who reported more overall learning from TITE would also report that it is important to stick to their decisions were 1.8 times greater than their counterparts who reported less overall learning from the intervention.

Table 2. Intervention Outcomes Related to Decision-Making for Youth

Variable	Overall Learning Learned More Than Before AOR (95% CI)
<i>It is important to...</i>	
stick to my decisions	1.80 (1.80-4.01)*
make good decisions	1.58 (0.69-3.62)
be responsible for my decisions	0.55 (0.22-1.37)
<i>Some things about me...</i>	
I list my options before making a decision	3.38 (1.03-11.09)*
I think about what might happen because of my decision	4.51 (2.04-9.99)***
After acting on my decision, I think about the results	2.47 (1.18-5.16)**

Note: *** Denotes the odds significant from reference group at $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

AOR = Adjusted odds ratio (for age).

Referent group for logistic regression: *Learned less than before the TITE intervention*

Discussion

We were interested in whether decision-making behaviors could be changed through an innovative approach that utilized a positive youth development framework and was enacted through drama and theater. We first found that the TITE intervention was successful in changing decision-making skills for youth participants from pre- to post-survey. Next, we found that participation in the TITE intervention was significantly associated with changes in the way youth thought about decision-making, in terms of both what is important about decision-making to youth and the processes of their decision-making. We found no major differences by race/ethnicity; however, the sample was primarily of Hispanic origin. We expect that these results would generalize to most youth in schools because the curriculum was developed to apply to a broad audience of youth. While it is interesting and important to find that decision-making skills were significantly increased for those program participants reporting increases in knowledge, abilities, and beliefs (what we have called overall learning), our next step is to examine more closely the components of the program that produce higher or lower levels of those constructs.

Our findings have important implications for stakeholders that design interventions and choose which interventions to employ at school. The results suggest that when practitioners are implementing youth development programming in the community, performance and peer-to-peer instruction may constitute effective strategies for knowledge transfer. This is consistent with findings by Kirby and Coyle (1997) that effective school-based programs to reduce risky sexual behaviors are those that provide for experiential activities and peer-to-peer educators. Thus, stakeholders who take part in the design of interventions should consider nontraditional

approaches to reaching out to youth, such as the use of educational performance. In addition, we posit that the results suggest that teachers and administrators can embrace and advocate for interventions that allow students to teach one another from positive youth development frameworks, as opposed to interventions that focus on risk and fear of negative outcomes. Life skills may be best taught with a trained group leader who employs a positive youth development framework and facilitates flexibility and creativity in the peer-to-peer interaction process.

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Successfully Changing the Landscape of Information Distribution: Extension Food Website Reaches People Locally and Globally

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Quantified Ag

The goal of the Food website was to develop Internet-based content that was relevant and reached the general public and multiplier groups, such as educators, health professionals, and media outlets. The purpose of this paper was to examine whether a multi-modal approach to information delivery through increases in and changes to content, electronic mailing list creation, and social media posting impacted user access, traffic channels, and referrals from 2010 to 2014. When comparing 2010-2011 versus 2013-2014, there was a 150% increase in total pageviews, 197% increase in unique pageviews, and a 39% increase in average time spent on a page. Since 2010, the website had over 5.2 million total pageviews, 3.1 million sessions, and 2.6 million users. In 2014, top social media referrals included Pinterest, Facebook, LinkedIn, and Twitter. Age of visitors ranged from 18 to 65+, with 45% being 18-34 years old. Approximately 70% were female. Visitors came from 229 countries/territories and 18,237 different cities. The website connects Nebraska and the world to the exciting food research and information generated at the University of Nebraska-Lincoln and is playing an increasingly important role in shaping the future of food in the local and global community.

Keywords: evaluating Extension information delivery methods, social media, Google Analytics, umbrella websites, Extension, Extension websites

Introduction

Food is a major part of our lives and for many people, their livelihood. Food is a topic of interest to a majority of our population, and the Internet has become an important source of information as people gain experience and embrace high-speed Internet connections. Eighty-seven percent of American adults now use the Internet, with 68% accessing the Internet through smartphones or tablet computers (Fox & Rainie, 2014). Polling from the Pew Research Center showed that adult

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ownership of cell phones rose from 53% in 2000 to 90% in 2014, while smartphone ownership grew from 35% in 2011 to 58% in 2014 (Fox & Rainie, 2014). Duggan and Smith (2013) reported that 73% of online adults use some type of social networking platform. Though Facebook remains the platform of choice for many, 42% of adults currently use two or more social networking sites. Unfortunately, with these new opportunities for reaching people, Extension typically has not been viewed as popular on the Internet (Rader, 2011).

In August 2010, University of Nebraska-Lincoln (UNL) Extension launched a statewide Food website with the goal of developing Internet-based content that reached and was relevant to the general public, as well as multiplier groups, such as educators, health professionals, and media outlets. It was a pioneer in connecting all the Extension food-related areas of a university on one “umbrella” website. The Food website houses information on food and nutrition, health and fitness, food safety, home food preservation, local foods, and youth/4-H, as well as links to the Nutrition Education Program, Food Allergy Research and Resource Program, Meat Products, and the Food Processing Center.

The website initially started with over 500 web pages and currently has 761. Additionally, over 400 educational materials (primarily ready-to-go handouts and PowerPoints) were available in 2010, and there are now over 1,300 available for downloading. Website information is personally developed by Extension staff or provided predominately by links to government agencies and other Extension websites nationwide. Educational delivery methods include newsletters, blogs, podcasts, calendar, videos, web articles, downloadable education materials (e.g., PowerPoints, handouts), posters, and access to subject matter experts. The purpose of this paper was to examine whether increases in and changes to content, creation of electronic mailing lists for distributing email newsletters and notifications, and social media posting impacted user access, traffic channels, and social media referrals from 2010 to 2014. User feedback and demographics were also collected and examined for 2014.

Methods

Several steps/methods have been cited for increasing Extension website traffic, such as keywords, page titles, headline tags, meta tags, inbound links, page rank, and website design (Hill, Rader, & Hino, 2012). Beyond these steps, features and formatting were created on the Food website that promoted sharing of content through email newsletters and electronic mailing list notifications, content curation, and various forms of social media.

The concept for this website was initiated by Extension administration to bring together all UNL Extension food-related content under one umbrella website. Initially during the website development phase (approximately 6 months), one Extension educator, in coordination with the Media Department, was designated (approximately 10 hours/week) to conduct focus groups and

administer surveys to identify overall website content areas with the following groups: campus departments with a food-related component, county staff, consumers, and other health professionals. Initial funding was provided to our Media Department to transfer existing content to the Food website. Since August 2010, members of the Food website team have been creating and curating content (maintenance phase) on the website.

The majority of website work during this maintenance phase is being completed by 11 Extension educators and specialists as part of their regular job responsibilities and ranges from about 5% to 20% of their time with methods utilized to repurpose material and work smarter, not harder. Rather than create several items, a central or primary piece was developed and then adapted for use in online formats, such as PDF handouts, web articles, and PowerPoints that could be adapted into short videos. Franzen-Castle, Henneman, and Ostdiek (2013) provided guidelines for reformatting and repurposing print and audio material for online use and gave an example of a print material that reached over 11,000 households, while the web-repurposed material achieved an additional nearly 92,000 views. Three steps/methods used to drive traffic to the website were content curation, social media with images, and email newsletters and notifications.

Website statistics were calculated using Google Analytics. Trends examined from 2010 to 2014 included sessions, total pageviews, unique pageviews, users, channel traffic (see Table 1 for definitions), access device (e.g., desktop [includes laptops], mobile, tablet), and country/territory and city of residence. Demographics (i.e., age and gender) were available through the websites' Google Analytics account from February through May 2014. Website user feedback was provided through direct emails to content authors and various online forms, such as embedded web feedback forms on select web pages and online surveys (i.e., Survey Monkey and Qualtrics).

Table 1. Terms Used and Corresponding Definitions from Google Analytics*

Term	Definition
Sessions	Represent number of individual sessions initiated by all users to the site. If a user is inactive on the site for 30 minutes or more, any future activity is attributed to a new session. Users that leave the site and return within 30 minutes are counted as part of the original session.
Total Pageviews	Total number of pages viewed. Repeated views of a single page are counted.
Users	Users that have had at least one session within the selected date range. Includes both new and returning users.
Unique Pageviews	Unique pageviews is the number of visits during which the specified page was viewed at least once. A unique pageview is counted for each page URL + page title combination.
None/Direct	Visitors who typed the URL directly into their browser. Also can refer to visitors who clicked on links from bookmarks/favorites, untagged links within emails, or links from documents that don't include tracking variables (e.g., PDF, Word documents).
Referral	Visitors referred by links on other websites or social media.
Organic	Visitors referred by an unpaid search engine listing (e.g., Google search).

Note: Terms and definitions represented in table current as of November 2014 by Google (Google Analytics Support, 2015; Park, 2009).

Results

Demographics

Google Analytics indicated in 2014, age of users ranged from 18 to 65+, with 45% being 18-34 years old. Approximately 68% were female, and 32% were male. Website users came from 200 countries/territories in 2010-2011 (Year 1) compared to 229 in 2013-2014 (Year 4). The top 10 countries/territories included the United States (US), Canada, United Kingdom, Australia, Philippines, India, New Zealand, Malaysia, Ireland and South Africa, with increases in users noted between the two time points (see Table 2). Website users came from 14,126 different cities in Year 1 and 18,237 in Year 4. Top 10 cities for 2013-2014 included New York, London, Lincoln, Chicago, Los Angeles, Toronto, Omaha, Sydney, Melbourne, and Manila. This nationwide and global outreach is a byproduct of the steps/methods taken to increase website traffic and involved no extra labor on our part. It speaks well of what Extension offers throughout the country in that Extension's information attracts such a wide audience.

Table 2. Increased Sessions on Food Website by Location

Top 10 Countries/Territories	2010-2011	2013-2014	% Change
United States	299,987	1,064,572	254.87%
Canada	21,024	110,429	425.25%
United Kingdom	12,667	91,805	624.76%
Australia	6,845	41,005	499.05%
Philippines	2,407	26,319	993.44%
India	2,323	23,544	913.52%
New Zealand	1,526	9,471	520.64%
Malaysia	981	7,897	704.99%
Ireland	1,040	7,207	592.98%
South Africa	873	7,205	725.32%
Totals	349,673	1,389,454	297.36%

Website User Behavior

Google Analytics was used to compare website user behavior and showed there were positive increases in total pageviews, unique pageviews, sessions, and users between 2010 and 2014. In Year 1, there were 843,810 total pageviews compared to 2,122,307 in Year 4, representing a 151% increase. Regarding unique pageviews, there was a 198% increase, with 590,467 in Year 1 versus 1,759,209 in Year 4. There was also a steady increase in sessions at 295%. In Year 1 there were 375,269 sessions, whereas there were 1,484,498 in Year 4. There were 302,486 users in Year 1 compared to 1,299,662 in Year 4, representing a 329% increase. Between the two time points, there was a shift in type of device used to access content. In Year 1, sessions were

accessed by desktops at 96% and 4% with a mobile device. In Year 4, sessions were accessed through desktops (56%), mobile devices (30%), and tablets (14%).

There were also shifts noted in traffic channels to the website. In Year 1, 17% came to the website directly (none/direct), 70% by links on other websites/social media (referral), and 13% came through unpaid search engines (organic; see Table 1 for traffic channel definitions). In Year 4, 12% were none/direct, 7% were referral, and 81% were organic. According to Google Analytics, Facebook, Pinterest, Twitter, and LinkedIn are the main social media drivers of traffic to the Food website. At the time of the website launch, there was no use of social media; however, the number has grown to almost 16,000 yearly sessions at the end of this calendar year, an increase of about 2,000 sessions per year and climbing.

User Feedback

Based on website user feedback (each user provided just one quote and was counted only once), four main themes emerged (see Table 3). The first theme centered on how people used the information professionally, with respondents providing feedback on method of distribution and target audiences. The second theme focused on how people used information personally. Many cited trying new recipes, being more active, and how information motivated them to be healthier. The third theme centered on how the website was a trusted and relevant source of information. The last theme highlighted the structure and organization of the website.

Table 3. Selected Quotes by Theme from Website User Feedback

Theme 1: Used Information Professionally	“I work with limited income homemakers and conduct a series of nutrition education lessons along with food preparation and food safety. I always use your handouts. Thank you.”
	“I use this [website] several times a month; share the information with other cooking instructor[s] and share information with customers in a retail store.”
	“Have used your PowerPoints for trainings of licensed child care providers.”
Theme 2: Used Information Personally	“I thought the information was great and I particularly like the recipes. It was clear the recipes were tested before incorporation into the newsletter and I appreciated the tips that were added.”
	“Receiving the email each month prompts me to think about healthy eating habits.”
	“Please know I am old [and] diabetic 50+ years, thus this Newsletter provides up-to-date info for me to continue in a healthy manner and be fairly active.”
Theme 3: Trusted and Relevant Resource	“Information is accurate; well researched; trusted professional resource.”
	“Very valuable information [and] very credible, which means a lot.”
	“I look at many of the state’s Extension websites and still find yours to be the very best of all of them. You cover such a variety and depth...Thank you.”

Theme 4: Organization and Structure of Website	“When I need something in a hurry you are definitely one of my go to sources.”
	“I enjoy all of the recipes and tips and articles. Thank you! Very organized and easy to use website.”
	“It was quick and easy to view, [and] then decide what you wanted to look at more in depth.”

Discussion

Based on changes made to methods of posting content, sharing information, and social media practices, the Food website had notable increases in total pageviews, sessions, users, and organic traffic. The dramatic increase in organic traffic was indicative of the website coming up higher in search engine results. Google Analytics was a powerful tool that assisted in the identification of successful social media platforms that directed visitors to the website, measured popular topics and documents at different times of the year, and helped identify potential areas for cross linking on web pages.

Content Curation

When contemplating content curation versus creation, it can be difficult to generate enough original content for search engine optimization. As a result, more marketers are moving to content curation as one of their social media strategies (Deshpande, 2011). Two major avenues of content curation for the Food website team included a monthly food-themed calendar and a shared Pinterest account. The calendar provided resources, tips, and recipes for selected national food- and health-themed days, weeks, and months. A calendar approach optimized the use of social media and search engines in promoting content, leading to increased visits, content downloads, and links to the Food website for more in-depth information (Colgrove, Henneman, & Franzen-Castle, 2014). Using food as a starting point allowed the expansion into other food-related disciplines such as horticulture, crop and animal agriculture, youth/4-H, and family health issues (Colgrove et al., 2014).

The second method of content curation was a shared Pinterest account where team members contributed pins related to topics within their expertise. Pins were mainly to the Food website, other Extension websites, and to government and other nationally-recognized websites where information was regarded as unbiased and research-based. Though suitable articles might be found on popular commercial websites, there might also be biased, inaccurate information and the Food website team did not want to appear to endorse those materials.

Social Media and Images

Top social media drivers of traffic to the Food website were Facebook, Pinterest, Twitter, and LinkedIn. Duggan and Smith (2013) reported at least daily usage by 63% of Facebook users, 46% of Twitter users, 23% of Pinterest users, and 13% of LinkedIn users. Based on the general popularity of these social media networks and Google Analytics data, optimizing the use and effectiveness of these types of social media was imperative in driving traffic to the website.

Visual social media was called a breakout trend in social media in 2012 (Walter, 2012). Hubspot, a company devoted to inbound marketing, found photos on Facebook generated 53% more likes than average posts when they evaluated 8,800 Facebook posts from company Facebook pages (Corliss, 2012). Pinterest, Twitter, and LinkedIn also have visual components to posts. Any web page with a photo can have that photo “pinned” to a Pinterest board with a link back to the webpage (unless the website owner has restricted pinning). In 2013, Twitter added inline images that showed up in the Twitter feed. Pictures may not show up across all social media management tools (Cooper, 2013; Torr, 2015). When Twitter’s data scientist analyzed millions of tweets, he found tweets with photos averaged a 35% boost in retweets (Rogers, 2014). As a result of the increased emphasis on images, more and larger images were included on the Food website so visitors could share better images when pinning or sharing a webpage URL. Resizing or cropping images to different dimensions may be necessary to optimize them for various social media sites (Henneman, 2014).

Email Newsletters and Notifications

A *New York Times* media columnist and Lack Professor of Media Studies at Boston University described the common perception and actual reality about email newsletters as, “Email newsletters, an old-school artifact of the web that was supposed to die along with dial-up connections, are not only still around, but very much on the march” (Carr, 2014, para. 2). According to one study, email was one of the top ways to acquire new customers, with customer acquisition quadrupling over the past four years (Goodman, 2013). In 2011, the Pew Internet Project found that among online adults, 92% use email, with 61% using it on an average day (Purcell, 2011). This puts even more importance on the subject, headlines, value statements, and calls to action of email efforts. Email newsletters/notifications of new website content can increase website traffic and engagement in several ways. Email is:

- Permission-based and received by people who have already indicated an interest in hearing from you,
- A means for encouraging return visits to a website,
- Able to provide people ongoing reminders of content,
- Easily shared with others,

- Capable of helping create a relationship between the sender and the recipients,
- Delivered directly to a person's inbox,
- Able to work on more than one type of computer system (e.g., Windows, Mac, Linux), and
- More likely to find its way to readers than tweets or posts (Curtis, 2011).

Though it is unlikely that all subscribers will open an email newsletter, the number of individuals that do may be higher than the number of clicks on a post to a social media platform. Typical rates at which people open email range from 15 to 25% (Constant Contact, 2015; Furgison, 2014; MailChimp, 2015), which may be much higher than the number of actual views of information posted in social media.

An evaluation of one of our email newsletters showed favorable results. Subscribers indicated they made positive behavior changes after receiving specific "how to" information consistently over a period of time (Henneman & Franzen-Castle, 2014). As a result of this positive feedback from subscribers, additional monthly email newsletters and notifications were established for other targeted audiences. More emphasis is now being placed on recruiting subscribers as one method of programming. Individuals could sign up for a newsletter on the Web, or with their knowledge and consent, provide their email address at educational venues and be added manually.

Conclusions

Data obtained from Google Analytics helped the Food website team make better decisions about how to manage the website. The website multiplies the team's efforts by assisting others with finding research-based, unbiased information. When comparing 2010-2011 versus 2013-2014, there was a 150% increase in total pageviews, 197% increase in unique pageviews, and a 39% increase in average time spent on a page. Since 2010, the website had over 5.2 million total pageviews, 3.1 million sessions, and 2.6 million users. The Food website team successfully adapted materials and presentations to digital formats, repurposed content for the Internet, and posted on social media sites to maximize programming efforts. The team also developed coordinated efforts regarding posting blogs, newsletters, food news, and social media posts that involved Extension specialists, educators, and assistants. UNL Extension is playing an increasingly important role in the global community in shaping the future of food. The Food website connects Nebraskans and the world to the exciting food research and information generated at the UNL and how it can help in their daily lives.

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Mindfully in Love: A Meta-Analysis of the Association Between Mindfulness and Relationship Satisfaction

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Mindfulness is an individual practice, where one has a heightened awareness of the present moment. An extensive research literature finds links between trait mindfulness and individual-level physical and mental health benefits. A limited but growing amount of research focuses on the association between mindfulness and romantic relationship satisfaction. Though there have been comprehensive reviews, no study has statistically tested the magnitude of the association between mindfulness and relationship satisfaction. Better understanding the value of this practice for relationships can serve to inform community educators and practitioners focused on promoting healthy family relationships. This study used a meta-analytic technique focused on 12 effect sizes from 10 different studies, and found that the relationship between mindfulness and relationship satisfaction was statistically significant with an overall effect size of .27. This finding suggests that higher levels of mindfulness are associated with higher levels of relationship satisfaction; therefore, educators can reasonably consider level of mindfulness as an education target.

Keywords: mindfulness, relationship satisfaction, meta-analysis, relationship education

Introduction

Mindfulness is an open attention to and awareness of the present moment. This attentiveness is felt internally and externally by using meditative techniques such as bringing awareness to the breath, practicing yoga, and engaging in focused activities, such as mindful eating or walking (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007). The practice is based in Eastern religious philosophy, but programs have been developed that glean the skills of the practice and teach them in an educational setting. Mindfulness is based on the principles of nonstriving, attention, beginner's mind, and nonjudgement. To be nonstriving means to have no agenda or purpose behind the choice to be mindful; rather mindfulness is about accepting and paying attention to experiences moment to moment. Having a beginner's mind is a key aspect of mindfulness, as well. Having an open and fresh attitude to your experiences while taking an

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impartial stance toward those experiences allows one to fully appreciate and understand the moment. The key to mindfulness is being open to each experience with thoughtfulness in order to notice feelings in a patient way. Being mindful also includes being nonjudgmental and gentle towards your experience and allowing yourself to let the experience exist exactly as it is without trying to force it to be different (Brantley & Millstine, 2008).

The most common training program is Mindfulness-Based Stress Reduction (MBSR) which was developed by John Kabat-Zinn in 1979. The MBSR program is typically eight weeks and focuses on different forms of mindful meditation practices. MBSR is used to develop an understanding of thoughts and feelings in the present moment in order to act skillfully, and not reactively, in all situations (Kabat-Zinn, 1990). Mindfulness practice typically involves setting aside a short period of time in one's day (anywhere between 5 minutes and an hour) to allow care for oneself in the moment, while recognizing and nurturing a healthy relationship with oneself and those around one.

There has been a major influx of interest in research on the use of mindfulness, with the majority of studies focused on physical and mental health benefits for the individual. There were 21 studies related to mindfulness published in 2000, but in 2013, there were 549 published articles related to mindfulness (Black, 2014). This surge coincides with increased funding by the National Science Foundation and the National Institute of Health to study the effect of mindfulness on health outcomes due to early indicators of health benefits (Hebert et al., 2001; Kabat-Zinn, Lipworth, Burney, & Sellers, 1987; Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003). A meta-analysis conducted by Grossman, Niemann, Schmidt, and Walach (2004) of 20 studies indicated improvements in mental health (e.g., anxiety, depression, binge eating disorder), with effect sizes (Cohen's *d*) ranging from .50-.54 for observational and controlled studies. There were also improvements for physical health (e.g., chronic pain, fibromyalgia, cancer), with effect sizes ranging from .42-.53 for observational and controlled studies (Grossman et al., 2004).

Though there are robust findings of mindfulness' effect on mental and physical health outcomes, there is a limited but growing number of research studies focused on relational outcomes. Mindfulness is an individual practice, but the essence of mindfulness is relational because it promotes unity, connection, and closeness within relationships (Kabat-Zinn, 1990). Several mindfulness practices are "other-oriented" with a focus on gratitude or well-wishing for others, normally referred to as a "loving kindness" practice. Research has found that mindfulness increases empathy in healthcare practitioners (Shapiro, Schwartz, & Bonner, 1998) and promotes acceptance and less avoidant behaviors in romantic relationships (Kabat-Zinn, 1990; Wachs & Cordova, 2007). Some research has also suggested that practicing mindfulness has positively influenced social connectedness (Deci & Ryan, 1991), social skills, and perspective taking (Schutte et al., 2001) and has inhibited negative reactivity during conflict (Baer, 2003). More

recently, researchers link the level of mindfulness and marital satisfaction and relationship quality (Barnes et al., 2007; Burpee & Langer, 2005; Wachs & Cordova, 2007).

Most recently, Kozlowski (2013) consolidated the work conducted on the association between mindfulness level and relationship satisfaction in a literature review and pointed out a trend towards a positive link between mindfulness and relational outcomes. Still, a systematic and analytical synthesis is needed to statistically validate the association between these two concepts. Therefore, a meta-analysis, a statistical method of rendering results of comparable studies and empirically quantifying an overall finding from the aggregate, was utilized in the current study. This is different than a literature review which typically involves a more descriptive, tallying approach (i.e., the number of studies reporting a positive association, the number of studies reporting no association). A literature review may also include unintentional author's bias in the description of findings. A meta-analysis statistically aggregates results in order to achieve statistical power from multiple studies instead of just one study.

In sum, research suggests the connection between healthy relational behaviors and increased mindfulness, as well as between healthy relationship skills and relationship quality (Overall, Fletcher, & Simpson, 2010); therefore, using meta-analytic techniques across existing studies, we expect to find that there will be a significant and positive association between mindfulness levels and relationship satisfaction. This is a critical next step that may provide enhanced validation for community educators to consider addressing mindfulness as a means for promoting more positive relationship behaviors and higher relationship quality.

Methods

Search Procedure

In addition to the studies listed in Kozlowski's (2013) literature review, we searched the literature for research focused on the relationship between mindfulness and romantic relationship outcomes (i.e., relationship satisfaction, relationship quality, etc.). First, we searched PsycINFO and Google Scholar using the keywords "mindfulness," "meditation," "romantic relationship," "marriage," "relationship satisfaction," and "relationship quality." Then, we reviewed the bibliographies of all the articles discovered in the initial internet search to find new sources. Finally, we searched the Mindfulness Research Guide (MRG) website that compiles all research focused on mindfulness. The source of each study included in the current meta-analysis is described in Table 1 on the next page.

Table 1. Description of Studies Included in Meta-Analysis

# Study name	<i>n</i>	Mindfulness Measure	RS Measure	Intervention	Dissertation/ Published	Source
1 Burpee & Langer (2005)	95	LMS	DAS	No	Published	Kozlowski (2012)
2 Barnes, Brown, Krusemark, Campbell, & Rogge (2007) – Study 1	82	MAAS	DAS & IMS	No	Published	Kozlowski (2012)
3 Barnes, Brown, Krusemark, Campbell, & Rogge (2007) – Study 2	57	MAAS	DAS	No	Published	Kozlowski (2012)
4 Michaels (2007)	24	KIMS	DAS	Yes	Dissertation	PsycINFO
5 Wachs & Cordova (2007)	62	IRI	DAS	No	Published	Kozlowski (2012)
6 Saavedra, Chapman, & Rogge (2010)	1702	MAAS	MAT	No	Published	Google Scholar
7 Giolzetti (2011)	328	FFMQ	TLS	No	Dissertation	PsycINFO
8 Jones, Welton, Oliver, & Thoburn (2011)	104	FFMQ	DAS	No	Published	Google Scholar
9 Ormiston (2011)	300	MAAS	KMSS	No	Dissertation	PsycINFO
10 Wiggins (2012)	331	FFMQ	DAS	No	Dissertation	PsycINFO
11 Gambrel & Piercy (2014a)	32	FFMQ	CSI	Yes	Published	MRG website
12 Parent et al. (2014)	242	FFMQ	QMI	No	Published	MRG website

Coding Data

The search procedures produced 17 relevant articles, six of which could not be used. Five of these studies could not be used because they were reviews or qualitative research studies and one could not be used because it used the same data from the same participants as another study. We contacted two authors to gain the correlation coefficient for their study, and both replied back with relevant information. Therefore, 11 publications with 12 studies/samples provided data for 12 effect sizes. One study (Barnes et al., 2007) completed two studies within one publication; therefore, there are two effect sizes calculated from that paper. Further, Study 1 from the same article utilized two measures of relationship quality; therefore, we combined the correlations to obtain the effect size. Four of the studies used in this meta-analysis are dissertations that have not been currently published in academic journals.

Data from each study were extracted and entered into an Excel spreadsheet. Number of study participants, means and standard deviations for mindfulness scores and relationship outcome scores, and provided correlation were included in the spreadsheet. If correlation data were not

provided, other pertinent data such as regression coefficients, *F* statistics, and *t* statistics were recorded and converted. Additionally, the first author of this study contacted the authors of the study in question to obtain necessary data for the meta-analysis.

Measures

A strength of the meta-analytic technique is the ability to group concepts in order to statistically test for the magnitude of a relationship even though original studies use different scales and measures to assess the same concept. In this study, the measures used in the original studies varied for both mindfulness measures and relationship quality measures but were conceptually similar. Further, the data we examined were collected concurrently and not at two different time points. If the study was an evaluation of a mindfulness program, the data used from the publication for the purposes of this study were pre-intervention data to remove bias or influence of the intervention on the measures.

Mindfulness measures. Five of the twelve studies assessed mindfulness using the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This scale assesses mindfulness on four dimensions: observing, describing, acting with awareness, and accepting without judgment. Further, four of the twelve studies assessed mindfulness using the Mindful Attention Awareness Scale (MAAS; MacKillop & Anderson, 2007) which is a global measure of attention or awareness in the moment. The last study used personally-developed mindfulness scales. Burpee and Langer (2005) used the Langer Mindfulness Scale (LMS; Langer, 2004) that assesses four key concepts related to mindfulness: novelty seeking, novelty producing, flexibility, and engagement. On all scales, higher scores indicate higher levels of individual mindfulness.

Relationship satisfaction. Five of the ten studies utilized the Dyadic Adjustment Scale (DAS; Spanier, 1976), a valid measure of relationship quality. The Couple Satisfaction Index (CSI; Funk & Rogge, 2007), a scale that measures relationship satisfaction or happiness, was used in one of the studies. Another scale that was utilized was the Marital Adjustment Test (MAT; Locke & Wallace, 1959) which assesses relationship satisfaction. The Triangular Love Scale (TLS; Sternberg, 1997) was utilized in another study. It assesses intimacy, passion, and commitment which are Sternberg's (1997) components of a satisfying relationship. The final measure of relationship satisfaction was the Kansas Marital Satisfaction Scale (KMSS; Schumm et al., 1986) to assess intimacy and commitment. On all scales, higher scores indicate higher levels of relationship satisfaction.

Effect Size

In a meta-analysis, effect sizes are used to calculate the magnitude of a relationship. Selecting an effect size metric is an important endeavor and is based on the type of question being asked

(Rosnow & Rosenthal, 2003). For the purposes of this study, the effect size metric used is the Fisher's z score. This metric is calculated from two continuous variables and is interpreted similarly to a correlation. It was transformed from the Pearson's correlation coefficients from each study to reduce correlation-dependent variance (Fisher, 1915).

Publication Bias

Publication bias was addressed by using Rosenthal's fail safe number (Rosenthal, 1979) and by plotting a funnel graph with sample size and effect size. The fail-safe number indicates how many "nonsignificant" studies would need to be published to make the results of the meta-analysis in question null. This number is calculated in meta-analytic computer software through a logarithm. If the fail-safe number is greater than $5n + 10$ (n = number of studies included in the meta-analysis), the results can be considered robust (Rosenthal, 1979). If it is not, there may be some publication bias.

A funnel plot allows us to plot the relationship between effect size and sample size. Studies with statistically significant results have a greater probability of publication, which will skew, or hollow out, the funnel. Further, if the effect size decreases as the sample size increases, the true effect size is small to moderate or suggesting that nonsignificant results are not published (Duval & Tweedie, 2000).

Data Analysis

Comprehensive Meta-Analysis (CMA) software was used for all calculations and associated random effects models. A random effects model was utilized, rather than a fixed effects model, because a random effects model assumes and assesses different true effect sizes based on between-study differences, rather than estimating a one true effect size like a fixed effects model which assumes no study differences. Individual effect sizes were calculated before calculating the weighted grand mean effect. Heterogeneity was also calculated to understand variance within and between studies.

Results

Mean Effect Size

As seen in Table 2, the effect (Fisher's $z = .279$) of mindfulness on relationship satisfaction was small to moderate (small = .10; moderate = .30; large = .50; Cohen, 1988) but is significantly different than zero ($p = .000$), which indicates higher levels of mindfulness are related to higher levels of relationship satisfaction. The individual effect sizes for each study ranged from -.130 to .425. The test of heterogeneity, or across-study variation, was nonsignificant ($Q = 15.205$, $p =$

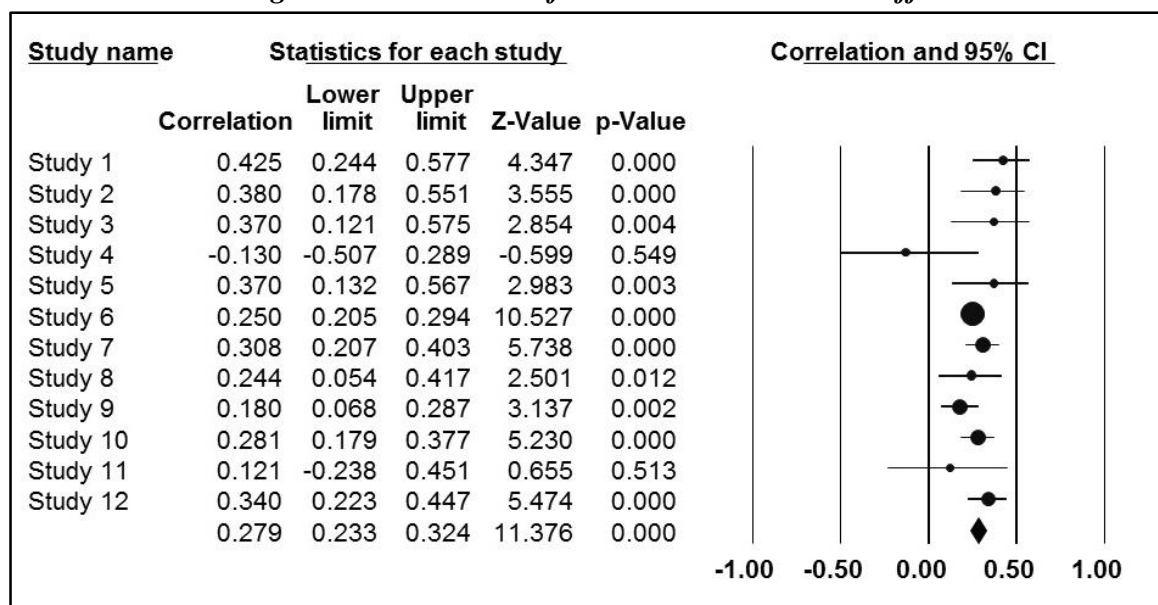
.173), indicating the true effect of mindfulness does not differ across studies, suggesting a robust relationship (Borenstein, Hedges, Higgins, & Rothstein, 2009; Higgins & Thompson, 2002).

Table 2. Results from the Random Effects Model of the Association Between Mindfulness and Relationship Satisfaction

	Effect Size and 95% CI			Significance		
	<i>k</i>	Fisher's <i>z</i>	Lower limit	Upper limit	<i>z</i>	<i>p</i>
Random Effects Model	12	.279	.233	.324	11.376	.000

Figure 1 shows the forest plot for the individual studies in the meta-analysis, as well as the overall mean effect for the association between mindfulness and romantic relationship satisfaction. A forest plot is a visual representation of the effect sizes and confidence intervals for each study, in addition to the overall effect and confidence interval. In sum, the association between mindfulness and relationship satisfaction was modest, but statistically significant.

Figure 1. Forest Plot of Individual and Overall Effect Size



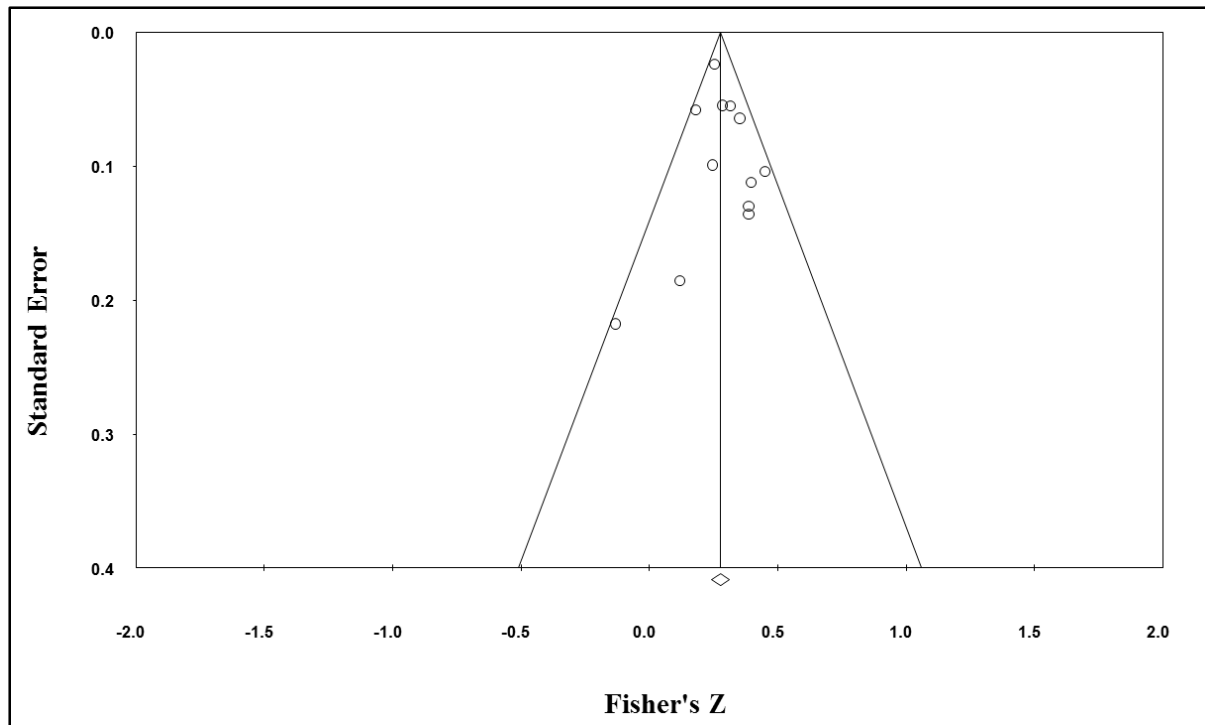
Note: Study number corresponds with studies included in Table 1.

Publication Bias

For the purposes of this study, the fail-safe number, calculated by the suggested equation $5n + 10$, is 70 (Rosenthal, 1979). The Rosenthal’s fail-safe number calculated in CMA was 63, suggesting there may be some publication bias. This may be because there are so few studies included in this meta-analysis. A funnel plot is a visual representation of the association between effect size and sample size. As shown in Figure 2, the funnel plot is relatively symmetric, which

is interpreted to mean no publication bias is present. Taken together, it appears that publication bias may not be a significant concern for this meta-analytic study.

Figure 2. Funnel Plot of the Standard Error and Fisher's z Effect Size



Discussion

The purpose of the present study was to determine the relationship between mindfulness and relationship satisfaction based on a meta-analysis of the available empirical evidence. Though mindfulness is an individual practice and is focused on experiencing one's own life in the present moment (Kabat-Zinn, 1990), there are elements of the practice that are relational and are expected to influence close relationships. The majority of the empirical work focused on the association between mindfulness and relationship satisfaction uses the principles of mindfulness and some relationship dynamic theory to serve as a reason to study the association. This study used empirical data from published and nonpublished sources to statistically assess the robustness of the link between mindfulness and relationship satisfaction. We find the association between mindfulness and relationship satisfaction is statistically significant, indicating when an individual is more mindful they are more satisfied in their romantic relationship.

This is noteworthy because as noted above, mindful practices are typically taught as an individual practice. There are, however, mindful practices that have an explicit focus on others, such as loving kindness meditations or aikido communication practices, which focus on caring

for others. In addition, mindfulness practice is about noticing many dimensions of the self, including feelings and thoughts related to relationships and interactions.

It may be that these aspects of other-oriented practices in Mindfulness Based Stress Reduction (MBSR) may serve to provide practical and attitudinal skills for addressing conflict more positively. In addition, the individual-focused elements of MBSR may positively influence the physical and mental health of the individual which may serve as a moderator of the stress response when in conflict with a partner, or the better physical or mental health outcomes (Grossman et al., 2004) may serve as a mediator of the relationship between mindfulness and relationship satisfaction. These are testable questions for future research. These results serve as further rationale for integrating mindfulness into relationship education or marital therapy to support other established efforts to improve the quality of the romantic relationship.

Implications

Newer applied work is combining mindfulness into relationship education programs. To date, there are four published studies assessing the effectiveness of a mindfulness-based relationship education programming on marital satisfaction or quality (Carson, Carson, Gil, & Baucom, 2004; Carson, Carson, Gil, & Baucom, 2007; Gambrel & Piercy, 2014a, 2014b). These studies focus on two separate programs, each developed independently. Carson and colleagues' (2004) program appears to improve levels of mindfulness and relationship satisfaction for nondistressed married couples. Further, Gambrel and Piercy's studies (2014a, 2014b) utilized a sample of expecting parents who reported improvements in mindfulness and relationship satisfaction, especially for men. Overall, the programs appear to positively impact the marital relationship in addition to improving levels of mindfulness.

To further support the marital relationship through mindfulness-based practices, practitioners can include more dyadic mindfulness practices, such as a loving kindness meditation or aikido communication. A loving kindness meditation allows participants to generate feelings of empathy, compassion, and gentleness towards another person while having a calming and stabilizing effect on the participants' minds (Kabat-Zinn, 1990). In recent work, it has been found that prayer for partner predicts greater relationship satisfaction and greater commitment to the relationship (Fincham, Beach, Lambert, Stillman, & Braithwaite, 2008), suggesting stating internally positive wishes or will for your partner can influence relational outcomes.

A more overt relational mindful practice is aikido communication whereby individuals within a dyad stop reactive and habitual reactions to conflict by uniting or blending with another's mind (Kabat-Zinn, 1990). One blends by listening, finding areas to agree, working together for a solution, and mutually agreeing on a compromise. This is done in a mindful and present manner to manage a conflictual situation in a healthy way. There may be other mindful practices that have a stronger emphasis on dyadic relationships.

Future Research

The current meta-analysis included 12 studies from 11 sources with useable data. Clearly, more research is needed to further validate this basic association. A larger empirical literature would also allow for tests of possible mediators or moderators of effects. Possible moderators may include gender, race/ethnicity, relationship status (i.e., married, engaged, dating, etc.), and previous exposure to meditation or mindfulness practices. Possible mediators may include emotion regulation skills, stress level, or physical and mental health.

Conclusion

In conclusion, this meta-analysis provides empirical evidence that the current literature on mindfulness and relationship satisfaction indicates more mindful individuals have higher relationship quality. This further validates the recent efforts to include mindfulness training in relationship education. Future basic and applied research to inform enhanced models of best practices for community education focused on promoting relational health is encouraged.

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* Indicates the studies that were included in the meta-analysis.

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Early-Career Residential Migration of Agriculture and Human Environmental Sciences B.S. Graduates: Evidence from One Land-Grant University

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The zip codes of agriculture (n = 346) and human environmental sciences (n = 304) bachelor's degree graduates were examined six to seven years after graduation to describe and compare pre-college and post-college residences (rural versus metropolitan) by major and overall. A majority of agriculture graduates were from rural areas (61.6%), and a majority of human environmental sciences graduates were from metropolitan areas (55.9%). Majorities of both agriculture (54.9%) and human environmental sciences (70.1%) graduates lived in metropolitan areas post-graduation, resulting in a net loss of 100 college-educated rural youth. Among rural graduates, there was no significant difference in the percentage of agriculture (62.4%) and human environmental sciences (57.5%) graduates currently living in rural areas. Among metropolitan graduates, twice as many agriculture graduates lived in rural areas after graduation as compared to human environmental sciences graduates. Graduates from rural areas were 11 times more likely than graduates from metropolitan areas to live in rural areas after graduation. Regardless of pre-college residence or major, nearly 40% of graduates lived in their home community after graduation, and 60% lived within 50 miles of their home community. Further research is needed to understand the decision-making processes and factors undergirding these residential patterns.

Keywords: agriculture, brain drain, human sciences, graduates, residential migration

Introduction

The out-migration of the most academically-talented youth from rural areas has been dubbed the “rural brain drain” and poses a threat not only to the social and economic vitality of rural communities, but also to their very survival (Artz & Yu, 2009; Carr & Kefalas, 2009; McGranahan & Beale, 2002). This out-migration of the “best kids” (Carr & Kefalas, 2009, p.

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29) leaves many rural communities with lower levels of human and social capital (Garasky, 2002; Gibbs, 2005), decreasing and aging populations (Lichter & Brown, 2014; Monk, 2007), decreasing tax bases (Gibbs, 2005), and shrinking economies (Petrin, Schafft, & Meece, 2014).

Human capital has been defined as, “productive wealth embodied in labour [sic], skills, and knowledge” (Organization for Economic Cooperation and Development, 2001, para. 2). Human capital theory (HCT) postulates that individuals primarily (but not exclusively) invest their time and money in education and training to develop their human capital with the expectation that this investment will result in higher future incomes (Tan, 2014). According to Goldin and Katz (2008), U.S. wage growth for much of the 20th Century was largely driven by increases in human capital through more widespread and higher levels of educational attainment.

HCT provides a logically-compelling framework for examining the “rural brain drain.” Under this scenario, the most academically-talented rural youth graduate from high school and leave home to attend colleges and universities (Carr & Kefalas, 2009). Upon graduation, with a degree and major that may or may not even be in demand in the rural home community (Marré, 2014), graduates enter the job market and are confronted with the reality of the rural-metropolitan wage gap, where college graduates employed in rural areas earn significantly less than graduates employed in metropolitan areas (Artz, Kimle, & Orazem, 2014; Kusmin, Gibbs, & Parker, 2008). Thus, given the assumptions of HCT, even graduates who desire to live in (or return to) rural areas may ultimately choose, if somewhat reluctantly, to accept employment and consequently live in metropolitan areas (Carr & Kefalas, 2009), or rural graduates may make economic sacrifices as the cost of returning to rural communities (von Reichert, Cromartie, & Arthun, 2011).

Agriculture and human environmental sciences as academic disciplines are historically connected to rural America with roots in Land-Grant Colleges (Seevers & Graham, 2012). Artz and Yu (2009) found that Iowa State University’s Colleges of Agriculture and Life Sciences and Human Sciences attracted the highest percentages of students from rural areas and had the highest percentages of graduates living in rural areas. The researchers posited that majors in these colleges were more closely aligned with rural employment opportunities than majors in other colleges. A number of studies (Johnson, Edgar, Edgar, Pate, & Steffen, 2015; McCallister, Lee, & Mason, 2005; Wildman & Torres, 2001) have found that students from small-town and rural areas make up significant portions of the undergraduate enrollment in departments and colleges of agriculture.

Using survey and institutional data, Artz et al. (2014) studied a stratified random sample of 5,416 Iowa State University bachelor’s degree graduates, representative of the 84,917 alumni between 1982 and 2006, to determine the economic returns to agriculture degrees based on employment sector (i.e., agriculture or nonagriculture) and job location (i.e., rural or urban). The researchers

found that only 21% of graduates were employed in agriculture in 2007, and that 60% of the agricultural jobs were located in urban, not rural, areas. In 2007, agriculture graduates working in rural areas made significantly less than agriculture graduates in urban areas working in agricultural (-\$16,427) and in nonagricultural (-\$36,207) jobs. Thus, even for agriculture majors, there appeared to be an economic incentive to work in urban areas.

In addition to economic rewards for metropolitan employment, Cortright (2014) noted a general preference among young college graduates for metropolitan living. According to Burbank and Keely (2014), 86% of 19 to 29 year-olds preferred to live in urban (38%) or suburban (48%) areas. Further, Demi, McLaughlin, and Snyder (2009) found that only 23.8% of rural 11th grade students aspiring to complete a bachelor's degree wanted to live in their rural home communities at age 30. There was a negative correlation between educational aspirations and desire to remain in the home community.

Estes, Estes, Johnson, Shoulders, and Edgar (in press) determined that graduates of the College of Agricultural, Food and Life Sciences, which includes the School of Human Environmental Sciences, at the University of Arkansas were significantly more likely than graduates of other colleges to both come from rural areas and to live in rural areas after graduation. The current study presents a further analysis of the original data to determine if there are differences between agriculture and human environmental sciences majors in pre- and post-college residence patterns.

Purpose and Objectives

The purpose of this study was to describe and compare the migration patterns of 2007 and 2008 agriculture and human environmental sciences graduates from a mid-south Land-Grant University located in a primarily rural state. Specific objectives were to:

1. Determine the percentages of agriculture and human environmental sciences graduates originally from rural and metropolitan communities and determine if there is a significant ($p < .05$) association between major and home community;
2. Determine the percentages of agriculture and human environmental sciences graduates currently residing in rural and metropolitan communities and determine if there is a significant ($p < .05$) association between major and current community;
3. Determine the percentages of agriculture and human environmental sciences graduates currently residing in rural and metropolitan communities by pre-college community; determine if there are significant ($p < .05$) associations between major and current community when controlling for pre-college community; and determine if there are significant associations ($p < .05$) between pre-college community and current community when controlling for major; and

4. Determine the percentages of agriculture and human environmental sciences graduates currently residing in home or nearby (≤ 50 miles) communities when controlling for pre-college community or major; determine if there are significant ($p < .05$) associations between major and currently residing in home or nearby communities when controlling for pre-college community; and determine if there are significant ($p < .05$) associations between pre-college community and currently residing in their home or nearby communities when controlling for major.

Methods

The data set for this study was provided by the University of Arkansas Alumni Association in March 2014 and included parents' (or guardians') zip codes at the time students first enrolled in the university, graduates' current zip codes, and the undergraduate college and major for all 2007 and 2008 bachelor's degree graduates ($N = 650$) from the College of Agricultural, Food and Life Sciences (AFLS), which includes the School of Human Environmental Sciences. According to the University of Arkansas Alumni Association, alumni mailing addresses (including zip codes) are updated every 90 days to ensure that all alumni mailings reach the intended recipient at his or her current address (T. Dover, personal communication, June 30, 2015). No names or other personal identifiers were provided to maintain the anonymity of graduates. Graduates from 2007 and 2008 were selected for study because at seven or six years, respectively, after graduation, these alumni were likely to have completed any post-graduate education and early-career transfers and be settled into fairly stable residential environments (von Reichert, Cromartie, & Arthun, 2014).

Parents' zip codes (at the time the student entered the university) and graduates' current zip codes were used to classify each graduate's pre-college residence and current residence as either rural/small town (hereinafter referred to as rural) or metropolitan based on the Rural-Urban Commuting Area (RUCA) zip code approximation database (Rural Health Research Center [RHRC], n.d.). The RUCA zip code approximation database is based on U.S. Department of Agriculture (USDA) RUCA codes and was last updated in 2005 (Hart, Larson, & Lishner, 2005). Primary RUCA codes range from 1 to 10, with codes 1 through 3 being *metropolitan* and codes 4 through 10 considered *rural* (U.S. Department of Agriculture Economic Research Service [USDA-ERS], 2012). Under this classification, a zip code was considered rural if it did not contain or partially contain a city of 50,000 or more in population (USDA-ERS, 2012).

Data were analyzed using descriptive and nonparametric statistics; the 0.05 *alpha* level was set *a priori* for all tests of statistical significance. The magnitude of all significant associations was described using odds ratios (*ORs*) and their 95% confidence intervals (Stokes, Davis, & Koch, 2012).

Results

The 650 AFLS bachelor's degree graduates in 2007 and 2008 were evenly distributed between years at 50.1% and 49.9%, respectively. The graduates were fairly evenly divided between agriculture (53.2%) and human environmental sciences (46.8%) majors. Overall, the specific majors with the most graduates were apparel merchandising and product development (19.4%), human development and family sciences (16.2%), agricultural business (16.0%), animal science (10.8%), and human development and family sciences (10.8%). A majority of agriculture graduates were male (58.1%), while the predominant majority of human environmental sciences graduates were female (90.5%). Overall, 64.6% of AFLS graduates were female and 35.4% were male. Chi square analyses revealed no significant ($p > .05$) differences by year for number of graduates, major (agriculture or human environmental sciences), or gender; thus, graduates from the two years were combined for all subsequent analyses.

Objective One

A majority of agriculture majors were originally from rural areas (61.6%), while a majority of human environmental sciences majors were from metropolitan areas (55.9%). As shown in Table 1, there was a significant association ($p < .001$) between major and pre-college residence. The calculated *OR* of 2.03 ($CI_{95} = 1.49$ to 2.78) indicated that agriculture graduates were approximately twice as likely to be from rural areas compared to human environmental sciences graduates.

Table 1. Pre-College Residence of Agriculture and Human Environmental Sciences Graduates

Major	Rural ($n = 347$)		Metro ($n = 303$)		χ^2
	<i>f</i>	%	<i>f</i>	%	
Agriculture ($n = 346$)	213	61.6	133	38.4	19.87***
Human Environmental Sciences ($n = 304$)	134	44.1	170	55.9	

Note: *** $p < .001$.

Objective Two

Six or seven years after graduation, a slight majority of agriculture graduates (54.9%) and a larger majority of human environmental sciences graduates (70.1%) were living in metropolitan areas (see Table 2), indicating a rural to metropolitan migration both by major and overall. There was a significant ($p < .001$) association between major and current residence, with a higher percentage of agriculture graduates (45.1%) living in rural areas as compared to human environmental sciences graduates (29.9%). The *OR* of 1.92 ($CI_{95} = 1.39$ to 2.66) indicated agriculture graduates were nearly twice as likely as human environmental sciences graduates to currently live in a rural area.

Table 2. Current Residence of Agriculture and Human Environmental Sciences Graduates

Major	Rural (n = 247)		Metro (n = 403)		χ^2
	f	%	f	%	
Agriculture (n = 346)	156	45.1	190	54.9	15.77***
Human Environmental Sciences (n = 304)	91	29.9	213	70.1	

Note: *** $p < .001$.

Objective Three

To gain a better understanding of who moves from rural to metropolitan communities (or, less commonly, from metropolitan to rural communities), students were grouped by pre-college residence and their current residences were examined by major. As shown in Table 3, the majority of rural agriculture (62.4%) and rural human environmental sciences (57.5%) graduates currently lived in rural areas. There was no significant ($p > .05$) association between major and current residence for graduates originally from rural areas.

Table 3. Current Residence of Agriculture and Human Environmental Sciences Graduates by Pre-College Residence

Pre-College Residence	Current Residence				χ^2
	Rural (n = 247)		Metropolitan (n = 403)		
Major	f	%	f	%	
Rural (n = 347)					
Agriculture (n = 213)	133	62.4	80	37.6	0.85 ^{NS}
Human Environmental Sciences (n = 134)	77	57.5	57	42.5	
Metropolitan (n = 303)					
Agriculture (n = 133)	23	17.3	110	82.7	5.71*
Human Environmental Sciences (n = 170)	14	8.2	156	91.8	
Rural (n = 347)					
Metropolitan (n = 303)	210	60.5	137	39.5	160.22***
Metropolitan (n = 303)	37	12.2	266	87.8	

Note: ^{NS}Not Significant ($p \geq .05$); * $p < .05$; *** $p < .001$.

A majority of both agriculture (82.7%) and human environmental sciences (91.8%) graduates originally from metropolitan areas currently lived in metropolitan areas (see Table 3). However, there was a significant ($p < .05$) association between major and current residence for students originally from metropolitan areas. Although small, the percentage of metropolitan agriculture graduates living in rural areas (17.3%) was twice as large as the percentage of metropolitan human environmental sciences graduates living in rural areas (8.2%). The calculated *OR* indicated a metropolitan agriculture graduate was 2.33 ($CI_{95} = 1.15$ to 4.73) times more likely to currently live in a rural area compared to a metropolitan human environmental sciences graduate.

There was a significant ($p < .001$) association between pre-college and current residence when controlling for major (see Table 3). A majority of rural graduates returned to rural communities (60.5%), and an even larger majority of metropolitan graduates returned to metropolitan communities (87.8%). The calculated *OR* indicated it was 11.02 ($CI_{95} = 7.34$ to 16.53) times more likely that a rural graduate would currently live in a rural area than would a metropolitan graduate.

Objective Four

There were no significant ($p > .05$) associations between major and percentages of graduates currently living in their home communities for either rural or metropolitan graduates (see Table 4). Slightly less than 40% of graduates, regardless of pre-college community or major, lived in their home communities.

Table 4. Agriculture and Human Environmental Sciences Graduates Returning to Home or Nearby (≤ 50 miles) Communities by Pre-College Residence

Pre-College Residence	Graduates Residing in:					
	Home Community ($n = 251$)			Nearby Community ^a ($n = 390$)		
	<i>f</i>	%	χ^2	<i>f</i>	%	χ^2
Rural ($n = 347$)						
Agriculture ($n = 213$)	85	39.9	0.12 ^{NS}	127	59.6	0.08 ^{NS}
Human Environmental Sciences ($n = 134$)	51	38.1		82	61.2	
Metropolitan ($n = 303$)						
Agriculture ($n = 133$)	52	39.1	0.13 ^{NS}	82	62.6	0.36 ^{NS}
Human Environmental Sciences ($n = 170$)	63	37.1		99	58.2	
Rural ($n = 347$)	136	39.2	0.10 ^{NS}	209	60.2	0.02 ^{NS}
Metropolitan ($n = 303$)	115	38.0		181	59.7	

Note: ^{NS}Not Significant ($p > .05$).

^aIncludes graduates living in their home community.

There were no significant ($p > .05$) associations between major and living in a nearby community (within 50 miles of home community) for either rural or metropolitan students (see Table 4). Approximately 60% of graduates, regardless of pre-college community or major, lived in or near their home communities as measured from center of pre-college zip code area to center of current zip code area.

Finally, there was no significant ($p > .05$) association between pre-college community type and the percentages of students either returning to their home communities or to within 50 miles of their home communities (see Table 4). Approximately 4 in 10 graduates originally from rural or

metropolitan communities returned to their home communities, while approximately 60% of each group currently lived in or within 50 miles of their home communities.

Discussion and Recommendations

The results of this study document the reality of the “rural brain drain” even among students majoring in agriculture and human environmental sciences at one Land-Grant University. Of the 347 graduates originally from rural areas, only 210 (60.5%) were living in rural areas six or seven years after graduation. Although this loss was partially offset by the 37 metropolitan graduates currently living in rural areas, rural communities experienced a net loss of 100 agriculture and human environmental sciences B.S. graduates from two graduating classes. This out-migration, while less than for other colleges at this university (Estes et al., in press), represents a significant loss in human capital for these rural communities.

This research also supports Human Capital Theory in that, overall, graduates were drawn to metropolitan areas where the economic returns to education tend to be greater (Artz et al., 2014). However, the migration of rural agriculture and human environmental sciences graduates was not as pronounced as the earnings differentials found by Artz et al. (2014) would suggest, possibly indicating that the noneconomic advantages of rural living may somewhat offset the economic advantages (von Reichert et al., 2011). Further research should be conducted to examine the career and residential decision-making processes of rural graduates.

Agriculture graduates were both significantly more likely ($OR = 2.03$) than human environmental sciences graduates to be from rural areas (61.6% versus 44.1%, respectively) and more likely ($OR = 1.92$) to currently live in rural areas (45.1% versus 29.9%, respectively). This is consistent with previous research (Johnson et al., 2015; McCallister et al., 2005; Wildman & Torres, 2001).

There was no significant difference between majors in the percentage of rural graduates currently living in rural areas; a majority of both rural agriculture (62.4%) and rural human environmental sciences (57.5%) majors were currently living in rural areas. Conversely, metropolitan agriculture majors were significantly more likely ($OR = 2.33$) than metropolitan human environmental sciences majors to currently live in rural areas. Thus, pre-college residence and major may interact to affect post-college residence only for some metropolitan agriculture majors. Further research should be conducted to better understand the nature of this interaction.

Overall, graduates originally from metropolitan areas were overwhelmingly (87.8%) living in metropolitan areas six or seven years after graduation. Despite the small gain in metropolitan agriculture graduates currently living in rural areas previously noted, rural graduates were 11.02 times more likely than metropolitan graduates to currently live in a rural area. While there was a

degree of “stickiness” associated with pre- and post-college residence for both rural and metropolitan students, this “stickiness” was much greater for students from metropolitan areas. Thus, metropolitan areas gained human capital relative to rural areas by retaining nearly 90% of their graduates while attracting approximately 40% of rural graduates.

There were no significant differences between agriculture and human environmental sciences graduates or between graduates from rural or metropolitan areas in the percentages of graduates currently living in their home community or within 50 miles of their home community. Almost 40% of all graduates currently lived in their home community, while approximately 60% currently lived either in or within 50 miles of their home community. Thus, all majors exhibited an equal propensity to remain close to home, regardless of major or home community. Further research should be conducted to determine whether students are motivated to remain close to home due to the availability of good career opportunities, or if graduates accept less-than-optimal career opportunities as a way to achieve their goal of remaining close to home (von Reichert et al., 2011).

Research should be conducted to determine the specific types of jobs secured by agriculture and human environmental sciences graduates living in rural areas. Are these graduates working in careers that make use of the specific skill sets developed in their degree programs, or are students accepting out-of-field employment as the cost of living in a rural area (von Reichert et al., 2011)?

Land-Grant Universities, especially disciplines in agriculture and human environmental sciences, with their historical commitment to rural areas, must play a key role in enhancing rural economic opportunities (Lichter & Brown, 2014). If rural communities are to survive, this role must include economic development activities that will increase the demand for college-educated workers in rural communities. Without availability of sufficient high-skill jobs, rural communities will most likely continue to export their most academically-talented students to metropolitan areas, while failing to attract significant numbers of metropolitan graduates.

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What Works for Parents: How Parents Support Their Children with Math Homework in Rural Ghana

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Family and Consumer Sciences (FCS) programs target families in deprived rural and urban communities with the objective of equipping them with skills to improve family well-being, education, and relationships. In recent years, the focus of FCS in Ghana has been on parental styles and education that foster parents' involvement in their children's school work. Using a child-parent interactive model, a series of math activities were delivered to children between the ages of 6 and 10 years. Group activities were also facilitated by the FCS staff. Parents used local materials, such as small empty cans, bottles, leaves, stones, sticks, old newspapers, and sand, to explain math concepts. Staff, parents, and children used fun activities and role plays to demonstrate developmental processes that enhance effective child development. The lessons identified were tied to the understanding of appropriate parenting styles that foster acquisition of skills for basic math concepts. At the end of the 12-week program, parents reported increased interest and confidence in math and were more proactive in supervising their children to complete their homework. The importance of the model lies in its simplicity in conveying fundamental knowledge that relates to the interwoven aspect of developmental domains to ensure children experience maximal success with math-related activities. The model also promotes acquisition of basic math skills in a naturalistic setting.

Keywords: child development, parental support, math homework, rural Ghana, developmental processes

Introduction

Family and Consumer Sciences (FCS) outreach programs continue to foster parental education and involvement in the school work of their children. It is well acknowledged that parents play a key role as a guide for children to understand the world and to acquire knowledge outside the classroom (Marion, 2010). Research results reveal that children develop mathematical skills as they continually engage with people and objects; they construct their own understanding of the physical world and gain “number sense” that they transfer to the classroom (Clements, 2004). For example, children understand basic concepts of mathematics (e.g., counting, size, volume,

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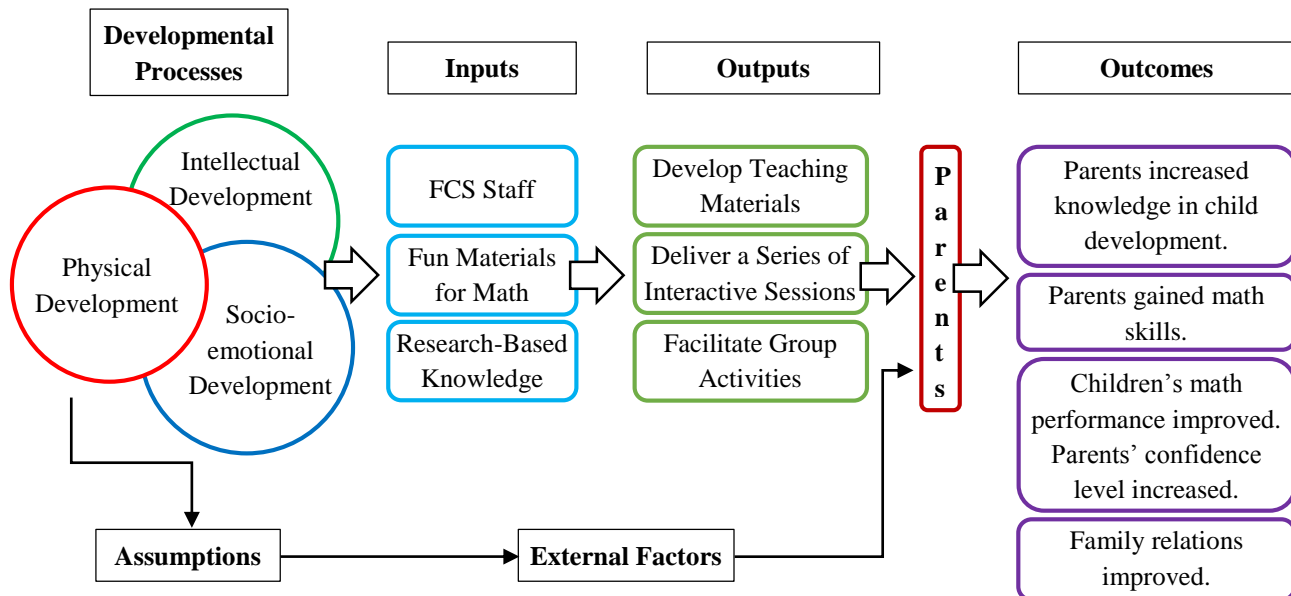
shapes and others) through play activities. As children compare, measure, manipulate, and estimate objects, they form relationships in their minds (Clements, 2001; Cohen, 1992; Copley, 2010). Dehaene (1997) argued that humans are born with a genetic disposition for “number sense” that allows them to understand an approximate sense of quantity right from birth. Dehaene (1997) contended that as children grow older and increase their interaction with the environment, they refine this disposition with language and become more precise with “number sense.” Similarly, because children are curious and have a keen desire to explore and experiment, they are described as mathematicians and scientists (Helping Children Learn at Home, 1997).

Against this backdrop of knowledge, parents and professionals are challenged to nurture children’s intuition about numbers before introducing them to abstract rules or formulas for math. Studies also indicate that when adults understand the holistic approach of supporting children by taking into consideration developmental domains, child-parent interaction could be planned to support children to improve basic math skills useful across domains, such as problem solving, decision making, estimation, socio-emotional functioning, and motor skills (Santrock, 2012). It is imperative for children to be encouraged to solve contextual problems and share their insight about objects and situations before they are exposed to procedural skills, particularly in math.

Conceptual Framework

When children are given the opportunity to make things, look at things, and talk about the things they make, they are able to express their feelings, make choices, solve problems, and develop perceptual abilities; thus, children are able to experience success. Therefore, activities that promote hands-on applied math concepts in a naturalistic environment should be encouraged. Interactive play that allows for conversation facilitates spatial development in children (Ness & Farenga, 2007).

The model presented in Figure 1 depicts the relationship between developmental processes (i.e., physical, intellectual, and socio-emotional) of the child and external factors, including material for teaching math and interactive teaching methods. The model assumes that a teacher’s interaction with parents in ‘fun math activities’ would enhance parents’ understanding of basic math concepts because they are gaining hands-on experience when working in group settings. Again, parents gain an understanding of the main developmental domains and how that relates to children’s involvement in activities and promotes their ability to comprehend and solve math problems.

Figure 1. Model for Improving Parental Styles and Enhancing Math Skills

Santrock (2010) stressed that children develop cognitive skills in a naturalistic environment when they focus on experimenting, exploring, discovering, and speaking and listening. Similarly, healthy socio-emotional development occurs when children are given opportunities to manipulate objects and interact with peers and adults, such as teachers. The model further assumes that children develop social skills through interaction by asking questions and sharing and discussing what they did with the materials. Santrock (2005) emphasizes that the three developmental processes (physical, socio-emotional, and cognition) are interwoven, and thus, development is promoted in all three areas simultaneously in a play/learning environment.

Application of Model

This paper describes a project based on this child-parent interactive model focused on enhancing skills related to the acquisition of basic math concepts among 6-10 year olds in Ghana. This project emerged as a response to address a preliminary issue reported by parents during a needs assessment interview. Parents reported that they had difficulty assisting their children with math homework because they did not understand the current course content in math. FCS staff in Ghana, therefore, designed this project as an intervention strategy to address the needs of parents.

The objectives of this project were to explore natural opportunities for parents to assist their children in learning math and also to find ways for parents and their children to acquire basic math skills through everyday experience. The project also aimed to engage parents and their

children in selected math activities and to show the relationship, if any, between developmental processes and parents' involvement in learning math. The interactive nature of this program provided capacity building among the children, parents, and FCS staff.

Parents who participated in an FCS Extension program between 2010 and 2011 in the rural community of Teiman (near the University of Ghana) were invited to participate in the project. Twelve parents were selected, and they completed all sessions of the 12-week program. In addition, two FCS staff and 12 children were also involved in the project. Each session lasted approximately one hour.

Researchers have hypothesized strong conceptual relationships between developmental processes and materials for children during play activities (Jent, Niec, & Baker, 2011; Marion, 2010). Thus, the project had parents use local materials, such as small empty cans, bottles, leaves, stones, sticks, newspapers, and sand, to explain math concepts. These materials served as physical objects for children to manipulate to help provide hands-on experiences for learning math concepts (Kamina & Iyer, 2009). Additionally, fun activities and role plays were utilized to demonstrate developmental processes that enhance effective child development. These lessons were tied to the understanding of appropriate parenting styles that would foster math skills.

Description of Math Activities

The children in the current project engaged with bamboo plants, looked critically at the branches, and made interesting things such as a flute, the alphabet letter "A," and a ruler. The children became aware of different lines, sizes, and shapes. They were able to verbalize these mathematical concepts and have interesting statements and conversations during the session. For example, with the bamboo sticks, children stated: "I have a long flute that I am using for my music" or "I have made a square with my sticks." Children learn math better when they are driven by their own interest (Geary, 2006). Parents can help children understand how math ties into real life. Each of the following photos depicts an intervention providing math experiences that incorporated the senses of the children and allowed them to experiment with materials, such as bamboo, cabbages, mangoes, and tomatoes. It also allowed them to make observations and investigations about these objects.



Image 1. Measuring Bamboo Sticks



Image 2. Cutting Bamboo Sticks



Image 3. Counting Cabbages



Image 4. Picking and Counting Mangoes



Image 5. Picking and Counting Tomatoes



Image 6. Exploring with Bamboo Sticks

Image 1 shows FCS staff with the children standing around the bamboo tree. The children were reaching out their hands to cut sizeable bamboo sticks that they would use during the project. *Image 2* depicts FCS Staff, parents, and children sitting and cutting and molding bamboo sticks into various shapes during math activities. *Image 3* shows children counting cabbages. *Image 4* depicts FCS staff and children reaching out and plucking mangoes on the mango tree and counting mangoes as they drop. *Image 5* shows children picking and counting tomatoes from a nearby garden. *Image 6* depicts children, FCS staff, and a parent exploring with bamboo sticks, chatting, and having fun.

The child-parent interactive model assumes that as the participating children cut and arrange bamboo sticks into shapes and sizes and organize them into instruments, such as flutes and counting objects, they are essentially developing physically in terms of brain and neuron processes. Similarly, the children in the project develop fine motor skills through the manipulation of the bamboo sticks. The model therefore proposes that the provision of inputs, such as the bamboo sticks, have the likelihood to facilitate high level cognition, imagination, and social competence when children are encouraged to use such materials. Smith (2009) argued that physical objects selected in the environment must “match” the developmental level of children using the materials. The sizes of the bamboo sticks used in this project were therefore fit for the developmental level of the children. The bamboo sticks used were light in terms of weight so children could handle and manipulate them; the lengths were between 6 and 12 inches. The adults assisted the children in getting bamboo sizes that the children appreciated and were comfortable working with in the activities.

Cognitively, as the children engaged with the materials provided in the project, they were able to process information about the materials in their environment. This included their ability to evaluate the materials, compare the various shapes and sizes, and make decisions about the materials and actions to take with regards to the materials. They also became imaginative and creative through the manipulation of the materials. Children also recalled their experiences, asked questions, and reasoned about objects and the situations around them. In doing so, they were able to articulate their ideas, build vocabulary, and develop interpersonal communicative skills (Fujise & Deacon, 2008; Santrock, 2012).

Results

Both children and parents demonstrated eagerness and curiosity as sessions progressed. All participants arrived on time for each session, without any reminders. Participants (children, parents, and FCS staff) were grouped into sections, and the materials for the activities were shared among them. The participants familiarized themselves with the materials and talked to each other as the sessions were introduced.

Children in the project used fascinating vocabulary to describe shapes, sizes, and colors. One child stated: “Bamboo sticks are like sugar cane sticks, let’s count the joints and share.” The idea of sharing as verbalized by the children provided them the experience of dividing objects between or amongst them, which can represent the concepts of subtraction, division, and fractions. Similarly, they experienced math concepts, such as sorting different sizes of bamboo sticks, classification of objects, and familiarizing with symmetric, geometry, and numeracy skills. Another child pointed out, “Green color is everywhere because all the leaves are green.” Further, they were sociable and seemed to be connecting with nature and learning at the same time. This supports Fjørtoft’s (2001) findings that when children’s daily learning environments approximate natural conditions, it results in increased interest to explore and a superior rate of knowledge acquisition. Parents reported that their children demonstrated certain skills for the first time. This includes impressive performance on fine motor skill activities that involve cutting and excelling on such activities as matching sticks. Additionally, counting fast and accurately measuring sand and water for the first time were reported by parents.

By the end of the 12-week sessions, children were able to act out roles that demonstrated their understanding of basic math skills, including counting, sorting, measuring, observing patterns, dividing, and describing situations. As shown in the photos, children and parents also gained math through everyday experiences. They were able to build vocabulary to express their mathematical experiences. Parents reported that their children had become more enthusiastic about homework and more adept at using materials from the community to understand math concepts. Parents did not only report increased confidence in assisting their children with homework, but also an improvement in quality of parent-child interaction. This was evidenced by statements, such as the following:

- “Now I understand how children gain skills when we do things together with them.”
- “I didn’t know that my child is capable of doing all these things.”
- “Now I know my child better. He is playing and learning math at the same time.”

Implications

Results from this project suggested that engaging parents, children, and their peers in learning activities enhanced acquisition of skill in various domains of development and may inform evidence-based practices in early childhood education. Observations from the project also indicated that using environmentally-based strategies that involve natural objects prior to introducing highly intensified and procedural strategies for learning math resulted in children approaching math with increased enthusiasm because of the associated fun activities. Additionally, thoughtfully arranged fun activities promoted natural interactive processes that enhanced the development of both cognitive and social skills. Parents’ roles as mediators and learners promoted group affection and co-operative learning as evidenced by previous studies

(Bunting & Cousins, 1985; Cohen 1992; Fjørtoft, 2001). In light of data from previous and current observations, it is expected that teachers would favor a multi-modal approach when introducing children to math while recognizing the positive impact of relying on practical objects, tools, and illustrations from the children's familiar environment. Additionally, FCS professionals need to encourage informal ways of learning new ideas, particularly in math and science, so parents who are less educated can be prepared with new skills to support their children.

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What's in Your Water? Development and Evaluation of the Virginia Household Water Quality Program and Virginia Master Well Owner Network

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Approximately one-fifth of Virginians (about 1.7 million people) rely on private water supplies (e.g., wells, springs, cisterns) for their household water. Unlike public water systems, the Environmental Protection Agency (EPA) does not regulate private systems. As a result, private water system owners are solely responsible for system maintenance and water quality but are often unaware of common issues and lack access to objective information. We report on the development and evaluation of the Virginia Household Water Quality Program (VAHWQP), an ongoing Virginia Cooperative Extension (VCE) program that provides affordable water testing and education about private water supply system maintenance and groundwater protection. A companion capacity-building program, the Virginia Master Well Owner Network (VAMWON), provides training to volunteers, agency collaborators, and VCE agents who support the goals and objectives of the VAHWQP by conducting VAHWQP drinking water clinics and other outreach efforts. Program assessment findings indicate that VAHWQP drinking water clinic participants regard this programming favorably and are taking recommended actions. We discuss the program assessment framework and continued efforts to improve these programs to achieve long-term behavioral changes regarding water testing and system maintenance, which will yield safer private water supplies and improved environmental stewardship.

Keywords: Cooperative Extension, outreach, volunteer, assessment, evaluation, groundwater, water quality, well water, domestic water supply, private water supply

Introduction

In 2005, the United States Geological Survey (USGS) estimated that approximately 3 out of 10 Virginians (2.2 million) depend on groundwater for their domestic water supply; 1.7 million of

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these use private water supplies, such as wells, springs, and cisterns (Kenny et al., 2009). The majority of households in 60 of Virginia's 95 counties rely on private water supplies. During 2013-2014 the Virginia Department of Health issued permits for 14,791 wells (Lance Gregory, personal communication, April 19, 2015). The heaviest reliance on private water supply systems is outside urban centers in rural areas, where new growth occurs beyond the availability of public water or sewer lines.

Of the homes in Virginia using private water supply systems, the vast majority also use septic systems—a combination that can result in water quality problems unless both the water supply and septic systems are properly designed, constructed, and maintained (U.S. Environmental Protection Agency [EPA], 2015a; 2015b). Thirty-one percent of Virginia's private water supply users report they live on lots of 0.4 hectare or less, which may make the proper siting of water supply and wastewater disposal systems difficult. Thirty-five percent of those with wells use fuel oil as their heat source, presenting another potential threat to the groundwater supply (Groundwater Protection Steering Committee [GWPSC], 2014). A clean, reliable water supply is essential to the maintenance of property values. Eighty-three percent of families using a private water supply system own their homes, and more than half have a mortgage (GWPSC, 2014). Poorly-constructed or maintained private wells have the potential to become direct conduits for groundwater contamination. Groundwater is a shared resource, and contamination can affect both private and public water supplies.

Ensuring safe drinking water is a particular challenge in rural areas. Unlike households served by public water systems, homeowners using a private water supply are responsible for all aspects of their water system management, including routine maintenance, regular water testing (monitoring), interpretation of test results, and addressing water quality or quantity problems. Lack of knowledge about private water supply management and water quality issues may lead to system neglect and the absence of regular water testing, which may render occupants of these households more vulnerable to exposure to waterborne contaminants. According to Craun et al. (2010) in their examination of reported drinking water disease outbreaks from 1971 to 2006 in the U.S., the number of outbreaks associated with public water supplies decreased considerably after 1980. However, the annual proportion of drinking water outbreaks associated with individual, or private, water systems increased during the same period.

To increase the awareness about household water quality issues and the inherent care and maintenance responsibility that those who rely on private water supply systems bear, the Virginia Household Water Quality Program (VAHWQP) was created in 1991. The VAHWQP is a Virginia Cooperative Extension (VCE) effort that is organized and operated by faculty in the Biological Systems Engineering (BSE) department at Virginia Tech. The VAHWQP began with a pilot drinking water clinic program in Warren County, Virginia (Ross et al., 1991). The purpose of the clinic was to inform participants about the quality of their household water and to

increase their understanding about how to care for and maintain private water supply systems. Since its inception, the VAHWQP has sought to build participant awareness by providing affordable, confidential water quality analysis, interpretation of those water quality test results, recommendations about system care and maintenance, and guidance in dealing with water quality problems, should they exist. The VAHWQP clinics focus solely on those Virginians reliant on private water supplies. Clinics involve extensive collaboration between on-campus BSE Cooperative Extension specialists and county-based Extension agents. Through several iterations of the VAHWQP program, clinics have been held in nearly all Virginia counties.

The Virginia Master Well Owner Network (VAMWON) was created in 2007 as a bolstering, capacity-building program to support the VAHWQP. VAMWON provides training to Extension agents, agency collaborators, and volunteers who assist in accomplishing the VAHWQP goals, shifting it from a program almost completely reliant on a campus-based Extension specialist to a diffuse network of local individuals who are able to effectively deliver VAHWQP drinking water clinics and other outreach programming focused on private water supplies across the state.

Drinking Water Clinics: Process and Delivery

The number of VAHWQP drinking water clinics conducted each year has varied. Since 2008, the number of clinics conducted annually has increased from 12 to about 45, with some clinics serving multiple counties. This increase is due in part to improvements in the clinic process (i.e., increased efficiency and staffing) and in part to the development of a group of trained and motivated VAMWON members, including volunteers, Extension agents, and agency collaborators. County Extension agents work with the VAHWQP coordinator to schedule clinics. The coordinator (a BSE Extension faculty member) provides resources to guide and assist the agent through the clinic delivery process, including a timeline; summary of frequently asked questions about the process of conducting a clinic; and templates for creating advertising fliers, press releases, and radio announcements (<http://www.wellwater.bse.vt.edu/>).

The drinking water clinic begins with advertising about 8-12 weeks prior to the clinic through local media outlets. Clinics are open to all residents who rely on a private water supply, and pre-registration is encouraged. Clinics are operated on a cost-recovery basis. The cost of participation has varied depending on laboratory operating costs and whether or not local financial support was secured to subsidize the cost of analysis (e.g., from county boards of supervisors, small local grants, or private organizations). In 2015, the cost for one sample kit, which includes testing for 14 parameters, was \$49. The process of delivering a VAHWQP drinking water clinic is outlined in Table 1.

Table 1. VAHWQP Drinking Water Clinic Process

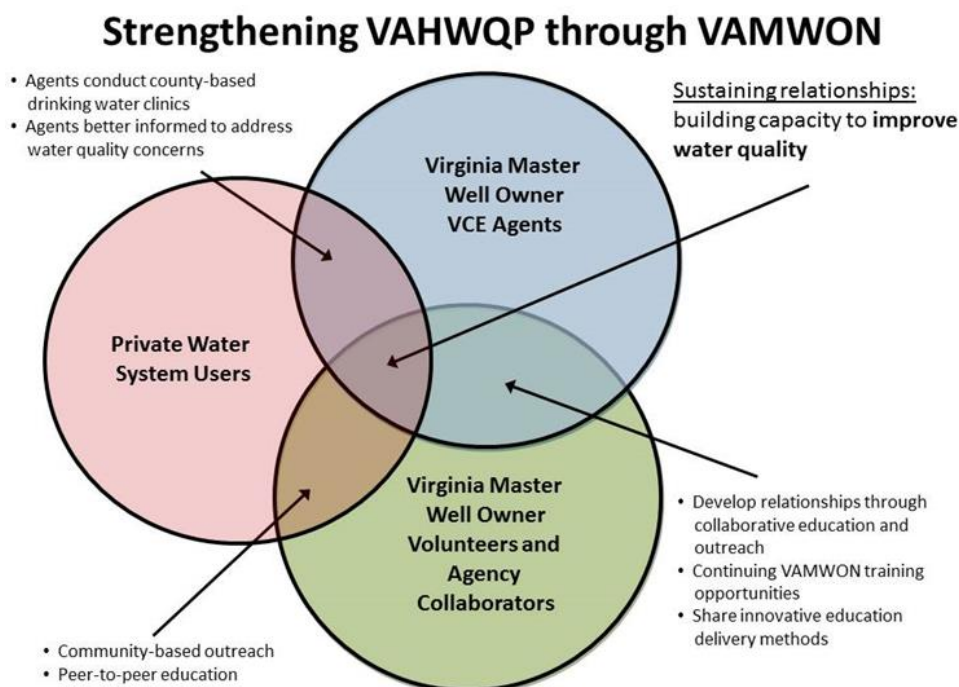
Kickoff meeting	An initial, brief evening meeting where homeowners receive basic information about the VAHWQP program, instructions for collecting a sample, and the opportunity to purchase sample test kits.
Sample collection and transport	After receiving their test kits, on a pre-determined morning, all homeowners collect samples and drop them off at a convenient location in the county. Samples are stored in coolers provided by VAHWQP. Participants also complete a short questionnaire enclosed in each sample kit that contains questions about water system characteristics, perceived water quality problems, and household demographic information. Sample transport back to campus is coordinated between the VAHWQP coordinator and the agent. On the morning when samples are collected, the agent meets a VAHWQP representative halfway, and the samples are transferred to the VAHWQP representative to complete the journey to the on-campus lab.
Sample analysis and report preparation	After arriving on campus, samples are analyzed for 14 parameters (total coliform bacteria, <i>Escherichia coli</i> bacteria, nitrate-nitrogen, sodium, iron, manganese, pH, copper, total dissolved solids [TDS], hardness, sulfate, lead, arsenic, and fluoride) using standard analytical procedures (Standard Methods for the Examination of Water & Wastewater, 2006). Sample analysis results and questionnaire data are entered into an Access database. The EPA (2015a) Safe Drinking Water Standards, which are enforced for public water systems, are used as guidelines for VAHWQP reporting. Water quality parameters out of range of the EPA (2015a) guidelines are identified on each sample analysis report. The reports are printed and sealed in envelopes with a sheet explaining each parameter tested, possible sources of contamination, health or nuisance effects, and suggestions for preventing contamination or water treatment, if needed.
Interpretation meeting	Three to four weeks after sample collection, an “interpretation meeting” is held in the county. At this meeting, participants receive their confidential water sample analysis results, and the coordinating Extension agent presents an approximately hour-long program that covers basic private water system care and maintenance and summarizes the sample data for the group, including chemistry and bacteriological analysis and sample questionnaire data. Additional information is provided concerning the most common water quality parameters out of range of the EPA (2015a) guidelines for that clinic. Potential sources of these contaminants, characteristics of water containing these contaminants, and possible health or aesthetic effects are covered, as well as general recommendations for addressing problems. Drinking water clinic participants often ask questions and generate discussion about the results, many of which are common issues or concerns in the group. An “intent to act” evaluation is administered at the close of each interpretation meeting which includes questions about actions participants plan to take (e.g., pursue additional testing, perform maintenance on their water system, pump out their septic system, install treatment devices). The agent conducting the clinic is also asked to evaluate the clinic process and provide feedback.

Building Program Capacity: Creating VAMWON

From the initial clinic in 1991, until budget-driven retirements significantly limited program activity in 2003, VAHWQP drinking water clinics were delivered almost exclusively by an on-campus BSE Extension specialist, who traveled to about 12 counties per year to deliver clinic programming. This model, while effective, was inefficient. In addition to time and travel costs, one issue with on-campus faculty delivering each clinic was that it made the program dependent on an “external” expert for information—little lasting local capacity was developed to assist participants after the clinic or between clinics. With a 2007 USDA-Cooperative State Research, Education and Extension grant (USDA-CSREES Competitive Grant No. 2007-51130-03877), the VAHWQP was revitalized, and a new companion, capacity-building program, the Virginia Master Well Owner Network (VAMWON) was established. Based upon the successful Pennsylvania Master Well Owner (MWON) program (Clemens, Swistock, & Sharpe, 2007), the VAMWON sought to build upon the historical successes of VAHWQP, by offering more intensive educational programming designed to build local knowledge and capacity within communities across the state. With the support of the USDA grant funds, a part-time VAHWQP/VAMWON Program Coordinator was hired in 2008 to organize drinking water clinics and VAMWON trainings; establish new partnerships; design educational programming; support VAMWON agents, volunteers, and agency collaborators; and develop an evaluation framework to continuously improve and expand VAHWQP/VAMWON programming.

VAMWON training workshops are open to county Extension agents, screened volunteers, and “agency collaborators” (i.e., employees of state agencies engaged in water resources programming, such as Departments of Health and Environmental Quality and Soil and Water Conservation Districts). Once trained, VAMWON Extension agents collaborate with on-campus faculty, the program coordinator, and willing agency collaborators to conduct drinking water clinics (see Figure 1 on the next page). After completing the VAMWON training and taking leadership to conduct a VAHWQP drinking water clinic, the county-based agent gains confidence and is seen as a trusted information resource to local clientele who rely on private water supplies.

Figure 1. Diagram Illustrating How the VAHWQP and VAMWON Programs Collaborate to Address Needs of Private Water Supply Users



VAMWON volunteers may not own or operate a business associated with private water supplies, such as a well drilling or water treatment company. VAMWON volunteers are considered “occasional volunteers” in the VCE system, meaning that a background check is not required. Volunteers do receive VCE-sanctioned training on risk management and liability. VAMWON-trained volunteers educate others locally and assist nearby VAMWON-trained Extension agents in conducting drinking water clinics. Volunteers share their knowledge in a range of ways, including having informal conversations with friends and neighbors, operating a booth at a home show or county fair, giving presentations to local churches or civic groups, or writing a story for their local newspaper.

VAMWON agency collaborators are essential for helping spread the word about VAHWQP drinking water clinics and resources, as many of them receive questions from the public pertaining to private water system management, water testing, and troubleshooting. Agency collaborators are also essential in assisting Extension agents with clientele questions during and after a VAHWQP drinking clinic interpretation meeting. The VAMWON/VAHWQP has resulted in more frequent and useful agency/Extension collaboration to help solve private water supply problems.

County-based VAMWON agents are recruited across all VCE programming areas: Agriculture and Natural Resources (ANR), Family and Consumer Sciences (FCS), and 4-H (youth development). VAMWON volunteers and agency collaborators are recruited in a variety of ways, through VAMWON-trained agents, from other Cooperative Extension volunteer programs (e.g., Master Gardener), as well as by advertising on the program listserv and website (<http://www.wellwater.bse.vt.edu>) and on other Virginia environmental and health group listservs. Interested VAMWON applicants complete a brief online application, where they provide contact information, reasons for interest in the program, and experience with water-related education. VAMWON training involves a day-long (i.e., seven contact hours) workshop. Workshops are held at venues across the state. Typically there are 1 to 4 VAMWON training workshops per year, depending on demand. VAMWON volunteer workshops typically take place on a Saturday. The structure of the volunteer and agent VAMWON workshops is very similar; however, the volunteer workshops include a session on outreach methods where current VAMWON volunteers share their experiences. The agent workshop includes information about the mechanics and logistics of conducting VAHWQP drinking water clinics (see Table 1). VAMWON-trained agents are expected to conduct a VAHWQP drinking water clinic within a year of becoming VAMWON certified. Agency collaborators tend to attend training workshops for Extension agents rather than volunteers. This can help agency collaborators develop relationships with nearby Extension agents and assist with future collaboration on VAHWQP drinking water clinics. The following topics are covered in VAMWON training workshops:

- Groundwater hydrology and Virginia physiographic provinces;
- Water quality testing and interpretation;
- Land use impacts and wellhead protection;
- Private well regulations, location, and maintenance;
- Homeowner maintenance of private water supplies;
- Water treatment and addressing water problems;
- Household water conservation;
- Springs and cisterns;
- Tips and strategies for outreach (volunteers only); and
- Conducting a VAHWQP drinking water clinic (Extension agent and agency collaborator only).

Each VAMWON trainee (agent, volunteer, or agency collaborator) receives a set of resource materials that includes publications from various sources (e.g., Cooperative Extension, EPA, USGS) that provide more depth about the topics covered during a VAMWON workshop. The resource materials also include the PowerPoint files from each training presentation. Each VAMWON training features guest speakers from organizations and agencies with significant real-world expertise on selected topics covered during the VAMWON training (e.g., well drillers and water treatment specialists from the Virginia Water Well Association, groundwater

hydrologists from the USGS or Virginia Department of Environmental Quality). On-campus faculty and the VAHWQP program coordinator present the remaining topics. VAMWON trainees are introduced to a physical, table-top groundwater model. Use of this model helps participants visualize concepts related to groundwater hydrology, aquifers, well construction, and groundwater contamination. VAHWQP has positioned several table-top groundwater models across the state. Trained VAMWON agents can check out these models to aid them in local program delivery.

VAMWON trainees are reminded throughout the training that their role is to provide basic information and recommendations and to always refer more technical questions to the program coordinator, on-campus faculty, or other qualified professional. In addition to the technical information in the VAMWON training, succinct “take-home messages” are emphasized for each topic. These “take-home messages” are reinforced with VAHWQP promotional materials, such as “Ten Tips” tri-fold brochure. The “Ten Tips” brochure and other promotional materials are provided to VAMWON trainees at no charge and are available for download via the program website. In addition to sharing basic recommendations for private water system maintenance and routine water quality testing, the VAHWQP and VAMWON programs seek to help homeowners be informed consumers so that they are prepared to ask appropriate questions and make informed decisions about any water system-related service or equipment purchases (e.g., new well pump, pressure tank, water softener, filtration system).

After completing the VAMWON workshop, trainees are given a post-test that includes 25 multiple choice questions. To become a VAMWON volunteer, agency collaborator, or agent, one must score at least 80% on the post-test. Trainees are also asked to complete an evaluation form. Analysis of the VAMWON workshop evaluation data enables continued adjustment and improvement of the workshop and related resources. Contact information for VAMWON volunteers and Extension agents is made available through the program website.

VAHWQP/VAMWON Supporting Resources

A number of resources have been developed to support the VAHWQP and VAMWON programs as they seek to inform Virginia residents reliant on private water supplies about the care and maintenance of their systems. These include:

- *The Virginia Household Water Quality Program Website*: Maintained by the program coordinator, this site (<http://www.wellwater.bse.vt.edu/index.php>) provides a portal to detailed program information, such as links to various publications and notifications of upcoming events.
- *Virginia Cooperative Extension household water quality publications*: A suite of 15 peer-reviewed Virginia Cooperative Extension publications that address a range of topics from how to shock chlorinate a well to water quality treatment basics. There are publications

that address in detail the risks associated with common water quality contaminants and recommended treatments to address the contaminant. Additional publications cover topics like emergency supplies of water for drinking and food preparation and water conservation.

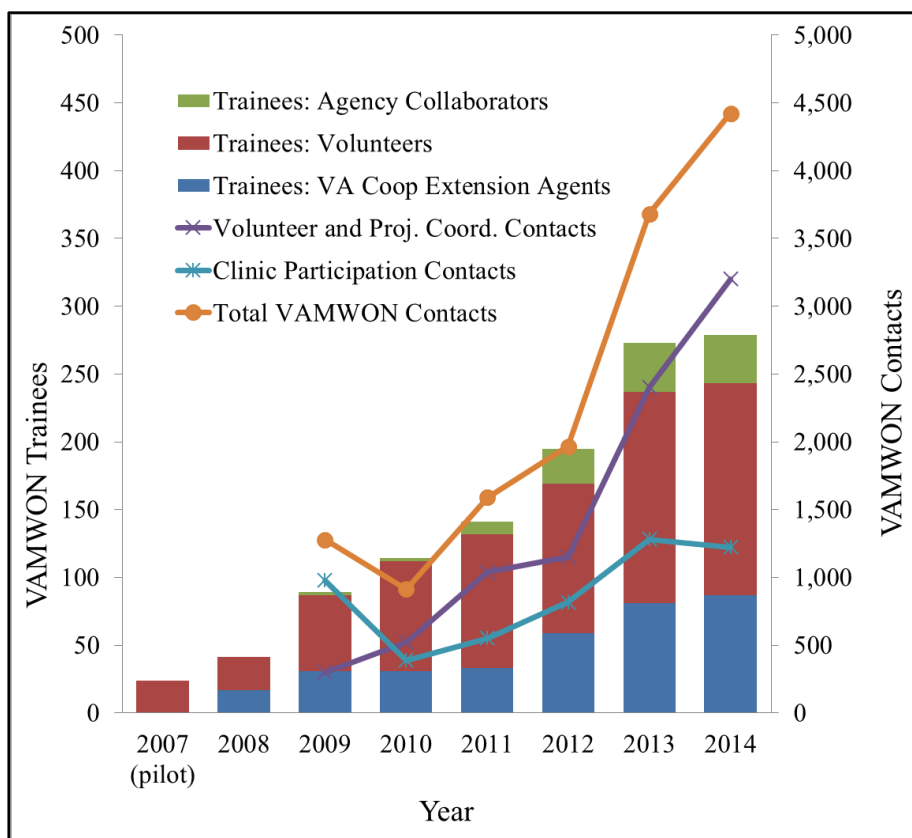
- *Drinking Water Clinic Summary Evaluation Reports*: Following each drinking water clinic, a summary of the water sample analysis and questionnaire results (i.e., water system characteristics, proximate sources of pollution, and perceptions of water quality) is made available via the program website. These reports are valuable to Extension agents and county officials as they provide useful reference material when addressing resident concerns.
- *3-D Table-top Groundwater Models*: As mentioned previously, these Envision™ (<http://www.envisionenviroed.net/>) groundwater models are used in VAMWON workshops to demonstrate groundwater hydrology concepts and land use impacts on water quality. The models may be checked out by VAMWON trainees.
- *Display Posters*: A “What’s in your Water?” poster was created to emphasize the VAHWQP “Ten Tips” discussed. Available for checkout by VAMWON trainees, this full-color, 3 ft by 4 ft laminated poster also describes VAMWON and VAHWQP programs in some detail.

VAMWON Impacts

Since beginning in 2007 through March 2015, 19 VAMWON trainings have been held, educating 243 VAMWON trainees (see Figure 2 on the next page). One hundred and forty-six volunteers have become certified VAMWON volunteers; 76 are still actively involved. From 2009 through 2014, VAMWON trainees and the program coordinator combined have reported over 12,850 educational contacts. In addition to the volunteers, 105 VCE agents have completed the VAMWON training. Seventy-six of these agents were still employed with VCE as of December 2014. These agents are actively engaged in conducting VAHWQP drinking water clinics. VAMWON trainees also include 29 agency collaborators. The vast majority (94%) of those that have completed the VAMWON training have rated them as *Excellent* or *Very Good*, and report significant knowledge gains across all the topics covered in the training, particularly the more technical topics, such as groundwater hydrology, well construction, and water treatment. Participants also report having a good understanding of how the VAHWQP and VAMWON programs function. VAHWQP faculty have observed a pattern of VAMWON volunteers participating in the training, giving it high marks on the evaluation form, and doing well on the post-test. However, it appears that many volunteer participants do not end up staying involved and reporting volunteer contacts but use the information gained for the benefit of better managing their own private water supplies. After surveying volunteers in 2014, program staff are developing a homeowner well care and maintenance course that would be more in-depth than the information provided during the drinking water clinics but not have a volunteer requirement.

These trainings will be delivered online for maximum ease of participation and access to well owners across the state starting in 2016. The program coordinator and faculty believe this will address the volunteer turnover observed thus far.

Figure 2. Virginia Master Well Owner Network Trainees and Associated Educational Contacts



VAMWON Volunteer, Agent, and Agency Collaborator Profile

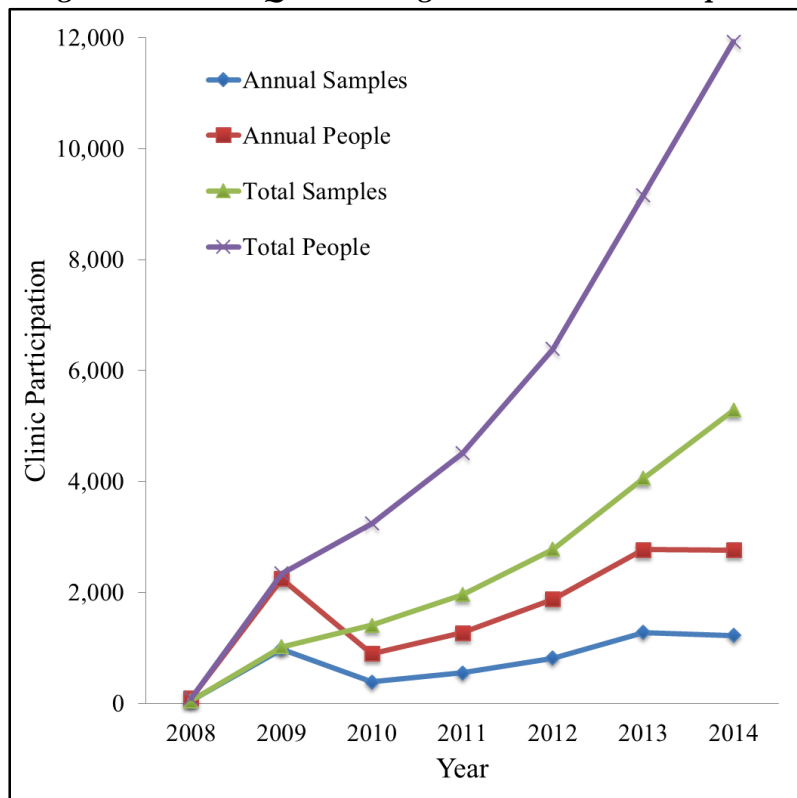
Twenty percent of VAMWON volunteers are retired; 34% have a professional background in engineering, science, geology, or water quality; 16% are teachers or outreach professionals; 6% are students; 6% are health/medical professionals; and 4% are realtors or home inspectors. VAMWON volunteers are slightly more likely to be female (54%) and average 52 years of age. Seventy-two percent report having some type of previous water quality educational experience, and 75% rely on a private water supply. VAMWON volunteers score an average of 95% on the training post-test. The program coordinator actively recruits both ANR and FCS educators to participate. Currently, 73% of VAMWON agents are ANR, 23% are FCS, and 4% are 4-H or other types of agents or assistants in Extension offices. Of the agency collaborators recruited for VAMWON thus far, about 80% are Virginia Department of Health employees (Environmental Health Specialists and Managers who administer the Virginia Private Well regulations), while

7% or less represent Soil and Water Conservation District, Department of Environmental Quality, or Department of Conservation and Recreation staff.

VAHWQP Drinking Water Clinic Impacts

Since 1991, nearly 18,400 water samples have been collected and analyzed through the VAHWQP drinking water clinics. Between January 2008, when the most recent iteration of the VAHWQP began, and December 2014, there have been 99 drinking water clinics, serving 80 of Virginia's 95 counties, resulting in the analysis of approximately 5,200 samples. Based on demographic data collected with the sample kit questionnaires, these clinics have impacted some 12,000 Virginians (see Figure 3). The number of VAHWQP drinking water clinics conducted annually has increased fourfold since 2008. The eventual goal of the program is to conduct a VAHWQP drinking water clinic in every Virginia County every other year.

Figure 3. VAHWQP Drinking Water Clinic Participation



Actions Taken by Clinic Participants

Of the VAHWQP drinking water clinic participants, about one-third completed and returned an “intent to act” survey that was distributed and collected at each VAHWQP interpretation meeting. These surveys indicated that following participation in a drinking water clinic, many

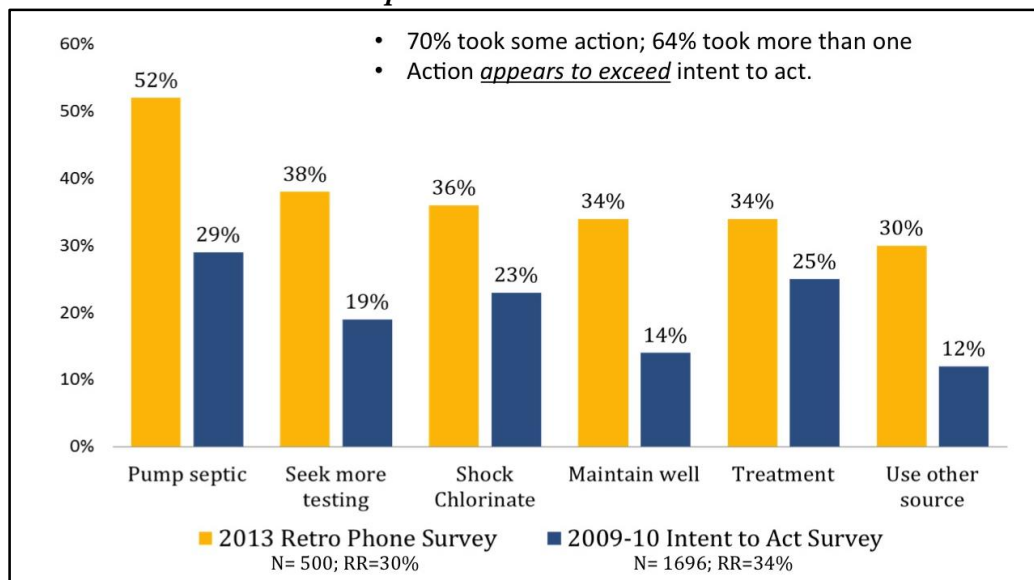
people planned to take some action to address issues with their private water supply system that were identified as a result of participating in the clinic. As a follow-up to these “intent to act” surveys, a retrospective phone survey was conducted in 2013 to ground-truth the “intent to act” data and gain a better understanding of actions drinking water clinic participants had actually taken. The follow-up phone survey work was partially supported through funding from USDA-NIFA Competitive Grant No. 2011-46100-31115.

Two groups of 250 participants were randomly selected from clinics conducted between 2008 and 2010. Group A consisted of well owners with test results that indicated no adverse findings. Group B were well owners with test results that indicated potential issues with either abnormal pH, the presence of *E. coli* bacteria, or both. Interviewers, blinded to the test results, asked six yes-no questions about possible actions recommended in interpretation meetings. Additionally, participants were asked three follow-up questions regarding their experience with the VAHWQP to further improve outreach.

Participants were contacted by phone during the evening hours between 5 and 8 pm EST over a period of several months during the summer and fall of 2013. Of the 500 participants contacted, 88 (18%) of calls were disconnected numbers, declined, or duplicate numbers; 264 (52%) were nonrespondents; and 148 (30%) completed surveys. Seventy-five percent of all respondents reported that they learned of upcoming clinics through VCE agents, either through direct Extension mailings (28%) or indirectly (47%) through newspaper advertisements placed by agents or articles written by the agent. Motivations for participation were overwhelmingly due to concerns about drinking water quality (69%). Overall satisfaction with the program was evaluated using a 4-point Likert scale with 1 = *Excellent*. The mean rating over the 148 surveyed participants was 1.3 (i.e., between *Excellent* and *Good*).

Of the completed surveys, 104 (70%) participants took some form of action following the clinic, and 64% took more than one form of action. The most common action taken was pumping the septic tank (52%), with each of the other actions taken by approximately 36% of participants (see Figure 4 on the next page). Forty-four (30%) of those that participated in the phone survey took no action. The most common reason given for taking no action was the perception that there were no problems with their private water supply system. The results of the retrospective phone survey indicated that VAHWQP drinking water clinic participants are taking more actions than they initially indicated, which is compelling.

Figure 4. Retrospective Phone Survey Data and Post Drinking Water Clinic “Intent to Act” Responses: “Intent to Act” vs. Action Taken



Lessons Learned and Future Directions

Several important lessons may be gleaned from the VAHWQP/VAMWON programming experience to date:

- 1. Hire a dedicated program coordinator.** Having a dedicated program coordinator is key. The time and energy required to organize training workshops, develop resources, build relationships, seek additional funding, field questions generated from the website and other resources, and recruit and support a strong VAMWON volunteer, agency collaborator, and Extension agent network is significant. If at all possible, creating a mentoring relationship with an existing, similar, successful program is extremely beneficial. The VAMWON program benefited tremendously from the wisdom and experiences from those responsible for the Pennsylvania Master Well Owner Network and from the mentoring of the retired Virginia Tech Extension Specialist who originally initiated VAHWQP. Adapting materials from existing programs (with permission and appropriate citations) saves time and resources.
- 2. Methodically plan for impact assessment from the outset.** A logic model to expand VAHWQP and create VAMWON was created as part of the process of writing the 2007 USDA proposal that revitalized the VAHWQP and created the VAMWON. This provided a great roadmap for program development and assessment and has allowed us to continually look at our programs critically and adjust them to address challenges and meet new opportunities. For example, we know from our demographic data collected from drinking water clinic participants that we are primarily reaching

Caucasians older than 50 years with high levels of education and income, indicating we need to do a better job of engaging younger homeowners or renters, particularly young families. Ideas for how to reach this audience include offering clinics through schools, HeadStart or similar programs, and expanding our online advertising. We are also making efforts to collect additional qualitative data about our participants, as the ways in which our programs help people are most powerfully captured through their stories. Similarly, after noticing a decline in participation from VAMWON volunteers a year or so after completing the training, despite these participants doing well on their post-tests and evaluating the program highly, program faculty have decided to develop a homeowner training course to be offered online, which will cover topics included in VAMWON training but not have a volunteer requirement. Regarding the VAHWQP clinics, additional follow-up surveys will be conducted every few years to understand actions taken by homeowners who participate in drinking water clinics.

- 3. Developing mutually beneficial partnerships is critical for success.** Building capacity takes time. An important first step in building support for our program was to reach out to existing organizations and groups that have interest and expertise with private water supplies. We sought cooperation and support from the Virginia Department of Health, the agency responsible for permitting new well and septic systems and for closing abandoned wells. We also sought support from the Virginia Department of Environmental Quality, the state agency responsible for wellhead protection for public water supplies that rely on groundwater. While we have not received financial support from these state agencies, several staff members from each agency have become VAMWON agency collaborators, and now serve as invaluable references for help with questions and referrals. We also actively sought to work with the Virginia Water Well Association, a trade group whose membership includes well drillers and water treatment specialists throughout Virginia. This relationship has blossomed and now fosters shared programming, including a new initiative, *WellCheck*, kicked off in late 2014 (<http://www.wellwater.bse.vt.edu/wellcheck.php>). Through *WellCheck*, we seek to connect drinking water clinic participants with concerns about their wells to licensed well contractors for standardized, affordable, easy-to-understand well inspections. Building partnerships with these organizations has allowed our program to expand our pool of expertise available to VAHWQP drinking water clinic participants and VAMWON trainees and has lent additional credibility to the VAHWQP and VAMWON efforts. Our programs have also benefited from collaborations with existing VCE volunteer networks that have a similar focus and approach to nonformal education, primarily Master Gardeners and Master Naturalists. In many cases, mutual needs may be met through these collaborations, and working with experienced outreach volunteers who are well-connected and respected in their communities is a great way to get the word out about a new program.

4. **Continue program development to engage new partners and resources.** We believe that our programs need to be continually evaluated and adjusted. We seek to build on our existing programs' successes in ways that can grow the scope of the program and produce additional impacts. Examples of this development include adapting our messages and resources to reach underserved audiences (e.g., translating publications into Spanish, ensuring that publications are written at an appropriate reading level). Plans include building in a youth component of programming to engage families through their children's experience in 4-H and expanding our relationship with well drillers across the state to provide additional technical support to clinic participants.

Summary and Conclusions

The Virginia Household Water Quality Program (VAHWQP) and Virginia Master Well Owner Network (VAMWON) are two linked, capacity-building programs with the shared objective of improving the water quality and health of Virginians who rely on private water supplies. In 2008, using a 3-year grant from USDA, the VAHWQP was revived and the VAMWON was created. VAMWON-trained volunteers and VCE agents work with on-campus faculty to deliver county-based VAHWQP drinking water clinics. The capacity to deliver VAHWQP drinking water clinics has nearly quadrupled in 6 years with 44 clinics scheduled in 2015. The VAHWQP goal is to conduct a clinic in each of Virginia's 95 counties every other year. The VAHWQP clinics and supporting resources are having an impact. A retrospective phone survey of past clinic participants indicated that participants were actively executing VAHWQP-recommended actions to better care for their private water supply system. Both the VAHWQP and the VAMOWN are continually evaluated and modified. The plan is to expand the VAMWON training to additional curricula and to expand the programs to reach youth.

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Teaching as an Intervention: Evaluating the AIAI-FTFD Teaching Model and 9 Skills of Communication in an Extension Learning Environment

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Extension educators are continually seeking ways to make instruction more effective and engaging. This study evaluated the Attention, Interact, Apply, and Invite – Fact, Think, Feel, Do (AIAI-FTFD) Start-to-Finish Teaching Model for human service educators in an ongoing Extension educational program to determine the effectiveness of this model in implementing the concept of “teaching as an intervention” in Extension educational programming. Specifically, the study assessed the cognitive, emotional, and intent to change behavioral learning outcomes generated by using the AIAI-FTFD teaching model while completing the 9 Important Communication Skills for Every Relationship (9 Skills) program. A self-reported quantitative evaluation design was utilized to assess key objectives in the sample (n = 152). Noticeable and clearly-evident effect sizes were found in perceived knowledge gain and perceived confidence gain in the ability to implement the skills covered in the training. Subsequent discussion focuses on how the AIAI-FTFD Start-to-Finish Teaching Model can facilitate change and learning in educational settings.

Keywords: teaching, effective teaching, Extension education, communication, human services

Introduction

Using intentional and sound pedagogical practices is critical to maximizing the change process in an Extension learning environment (Cole, 1981; Mace, 1981; Powell & Cassidy, 2007; Stevenson & Harris, 2014). Catching the learners’ attention, introducing new information, facilitating interaction between the teacher and the learners, and providing experimental methods for the learners to apply and practice targeted cognitive, emotional, and behavioral learning skills, both during and after educational programming, has been shown to maximize learning outcomes (Edgar, 1969; Harris, Morrow, Moen, Teemant, & Kumaran, 2014; Merrill, 1997). Often, when teaching practices are not intentional and pedagogy is not sound, too much

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information is presented with too little time spent on applying and practicing target skills. Unfortunately, this occurs all too often in a typical learning environment. Cognitive overload, a situation in which a learner is presented with too much information at once, may inhibit an individual from successfully learning the core concepts being taught (Paas, Renkl, & Sweller, 2004). This information dumping and consequential overload may impact overall outcomes for learners. Conversely, active learning (e.g., in-class activity, application, and participation), as opposed to more-straightforward lecture (e.g., information dumping) techniques, has been shown to result in higher student gains on class-specific outcomes (Hackathorn, Solomon, Blankmeyer, Tennial, & Garczynski, 2011; Michel, Cater, & Varela, 2009). Many educators in a variety of subject areas and settings seek to facilitate student learning, prevent information overload, and help students achieve understanding and success. When faced with the goal of teaching content effectively to students, educators need strategies for how to cover manageable amounts of content in meaningful ways with all groups of learners.

One antidote to information dumping is teaching less better by focusing on a few target skills and carefully evaluating resultant learning outcomes (Harris et al., 2014). At the individual level, teaching approaches exist to implement this strategy in a variety of learning environments. The Attention, Interact, Apply, and Invite – Fact, Think, Feel, Do (AIAI-FTFD) Start-to-Finish Teaching Model is a teaching tool that can be used in many subject areas to practice the idea of teaching less better. This teaching model was specifically applied to a communication skills training in this study and then evaluated based on the participants' reported training outcomes. Through examining pertinent background information and application of this model, insight can be gained to potentially inform future approaches to education and teaching within Extension.

Background

Teaching as an Intervention

Effective teaching occurs when the learner gains knowledge and demonstrates related skills associated with the content being presented (Badger, 2008; Franz, 2007; Merrill, 1991). Previous research has demonstrated that effective teaching methods must include at least the following: assessing learner needs and addressing these specific needs in the teaching environment; founding teaching practices on theory-based and empirically-informed methodologies; understanding, negotiating, and managing learners and group processes successfully; and realistically evaluating the teaching experience (Gagné, Briggs, & Wager, 1992; Latham, 2002; Powell & Cassidy, 2007).

According to Wiggins and McTighe (2005), the goals of effective “curriculum and instruction [are] designed to engage learners in inquiry, promote transfer of learning, provide a conceptual framework for helping learners make sense of discrete facts and skills, and uncover the big ideas

of content” (p. 4). Instructors should consider what the learner will need in order to accomplish these goals and identify specific cognitive, emotional, and behavioral target skills (i.e., learning outcomes). Related approaches may also include identifying which higher-order thinking (cognitive) skills will be covered in the program or lesson (Anderson & Krathwohl, 2001; Bloom, 1956). It is virtually impossible to evaluate and measure these learning outcomes if they are not intentionally identified prior to teaching. Therefore, as identified above, effective teaching plans must begin with assessing the learners’ needs (Harris et al., 2014). Knowing the learners and their felt, ascribed, and future needs at the outset (Powell & Cassidy, 2007) allows the instructional outline to be specifically tailored to the learners’ unique needs, thus maximizing the potential for positive learning outcomes.

Once learners’ needs have been assessed, associated content has been determined, and specific learning outcomes have been identified, establishing clear learner-centered objectives and goals are essential to guiding the teaching preparation and delivery process (Bennett & Rockwell, 1995; Gagné et al., 1992). Clarifying and determining the instructor and learner objectives and goals informs best practice instructional designs for content mastery, understanding, and application (Harris et al., 2014; Merrill, 1991, 1997). Objectives can also help instructors focus the lesson, assess the effectiveness of instruction, and point toward opportunities for improvement in future training (Tyler, 1949).

Other best practices, as compiled by Rosenshine (1983), emphasize the importance of structure, examples, feedback, and opportunities for continued practice. The effectiveness of a particular teaching pedagogy is ultimately determined by whether or not identified learning outcomes were achieved. The overall aim of a teaching outline should be to shape the content and instructional techniques into an intentional lesson plan for how to engage the learner and maximize learning outcomes (Gagné et al., 1992; Harris et al., 2014; Wiggins & McTighe, 2005).

The AIAI-FTFD Teaching Model

The Attention, Interact, Apply, and Invite (AIAI) – Fact, Think, Feel, Do (FTFD) Start-to-Finish Teaching Model (see Figure 1) is an instructional tool that can be used across a diverse set of topics and contexts in Human Service and Extension (HSE) disciplines to improve instruction and learning outcomes (Harris et al., 2014). The organization of the model can be used both as an outline instructors develop and modify and as a conceptual map for educators to use as they plan their lesson content. The model conceptualizes principles of effective teaching in a systematic, step-by-step, start-to-finish format, outlining specific preparation and delivery procedures (Gagné et al., 1992; Harris, Chartier, & Davis, 2010; Harris & Lee, 2006).

The primary foci of the AIAI-FTFD teaching model include initially assessing learners’ needs and then targeting learning outcomes measured by cognitive, emotional (e.g., confidence, attitudes), and/or behavioral skills that the instructor identifies as important to the learning process. The

AIAI-FTFD teaching model solicits instructors to begin the instructional process by successfully catching the attention of learners. This first step in the model, *Attention*, is designed specifically to engage learners and then move them quickly to the second step in the teaching process, *Interaction*. This step allows the instructor to engage learners with pertinent information and concepts. Information is communicated via different sensory modalities (i.e., visual, auditory, kinesthetic), primarily through facilitating discussion rather than lecture, except in certain contexts when lecture (or playing the expert role) is required. The instructor may also use the consultation role when learners are engaged individually or in groups with tasks (e.g., problem-based learning exercises) that require the instructor to provide input and expertise when asked (Powell & Cassidy, 2007; Teemant, Moen, & Harris, 2013).

Discussion facilitation is driven by asking learners four kinds of specific, goal-directed questions (i.e., Fact, Think, Feel, Do) about the given topic and then guiding the learners to interact with the information, the instructor, and each other. Specifically, the Fact, Think, Feel, Do (FTFD) component of the teaching model includes a systematic series of questions instructors may pose to the learners to engage in higher level critical thinking and meaningful discussion. Research indicates that effective questioning promotes higher levels of thinking and improves overall retention of information learned (Edgar, 1969; Gagné et al., 1992).

Application, or applying the information learned, is the third step in the AIAI-FTFD teaching process. There is direct positive association between the amount of time spent on this step and positive learning outcomes (Harris & Lee, 2006; Harris et al., 2010). Application consists of encouraging learners to make practical applications of the principles and materials the presentation covers. Application also allows for learners to achieve new cognitive, emotional, and behavioral learning outcomes pertaining to the material taught. The AIAI-FTFD teaching model emphasizes the importance of taking intentional time to allow learners to practice these target skills during the presentation and then introduces a strategy in the *Invitation* step for learners to be able to continue to practice and track these skills at home. The invitation is often introduced in the form of homework and/or through the use of a tracking chart to evaluate ongoing progress for achieving the identified target skills (Badger, 2008; Harris et al., 2014). The *Preparation* section of the AIAI-FTFD teaching model (see Figure 1) requires instructors to create lesson plans by (a) assessing learners' needs; (b) deciding on associated content; (c) determining cognitive, emotional, and behavioral target skills; (d) listing instructional objectives and overall learning goals; (e) identifying what the instructor and the learner will do to accomplish identified learning outcomes (i.e., target skills); and (f) determining the type of content, the mental processes that will be engaged, the method of delivery, and the general teaching roles instructors will play in executing this plan (e.g., expert, facilitator, or consultant) (Harris et al., 2010, 2014). The model also provides a specific method of instructional *Delivery* to implement this plan. Many methods of instruction are available, but few are organized into a start-to-finish, step-by-step model for preparing Human Service and Extension (HSE) professionals and other instructors to teach effectively.

Figure 1. AIAI-FTFD Start-to-Finish Conceptual Instructional Model

THE AIAI-FTFD START-TO-FINISH INSTRUCTIONAL MODEL

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Preparation: Topic

Target Audience: Student Need(s): <u>Content 2-3 Concepts/Principles I will teach:</u> 1. 2. 3.		Overall Goal:			
Target Skills-Cognitive (knowledge), Emotional (confidence - attitude change), and Behavioral (skills) Processes: 1. Cognitive/Know (C) – 2. Emotional/Apply (E) – 3. Behavioral/Practice (B) –		Objectives (mapped to target skills): 1. (C) – Participants will identify (know) . . . 2. (E) – Participants will apply . . . 3. (B) – Participants will practice . . .			
AIAI-FTFD Variety: Role: Expert, Facilitator, or Consultant (Circle One)					
<u>Unit/Section</u>	<u>Instructor Will Do</u> (List Items) 1. (C) Know 2. (E) Apply 3. (B) Practice	<u>Learner Will Do</u> (List Items) 1. (C) Know 2. (E) Apply 3. (B) Practice	<u>Content</u> (Circle Items) <i>This lesson will use:</i> 1. Facts 2. Concepts 3. Principles	<u>Mental Processes</u> (Circle Items) <i>This lesson will engage:</i> 1. Remember 2. Understand 3. Apply 4. Analyze 5. Evaluate 6. Solve 7. Create 8. Design	<u>Method</u> (Circle Items) <i>This lesson will use:</i> 1. Audio 2. Visual 3. Praxis
Delivery: Lesson Outline			Role: Expert, Facilitator, Consultant		
Attention: Interaction: Apply: Practice Target Skills: Cognitive, Emotional, Behavioral (5-10 minutes) Invite:			<u>Question Types:</u> -Fact -Think -Feel -Do		

Communication Skills

In this study, the AIAI-FTFD model was specifically applied in the context of a communications skills training. Communication skills are fundamental to effective teaching and successful relationships (Harris, 2010; Teemant et al., 2013). Healthy communication and conflict resolution patterns are linked to family and relationship stability and well-being (Gottman, 1994a; Harris, Schramm, Marshall, & Lee, 2012; Larson, 2003). Unhealthy communication and conflict resolution patterns negatively influence individuals, couples, families, and children and are linked to marital dissolution and family fragmentation (Amato, 2005; Gottman, 1994b). Children often experience the physical and emotional absence of one or both parents along with severe economic hardship due to family fragmentation (Schramm, 2009). Therefore, establishing healthy patterns of communication and conflict resolution are critical to promoting individual, couple, family, and child stability and well-being (Harris, 2014a, 2014b). While many agencies may provide communication and conflict resolution training, Cooperative Extension is uniquely positioned to provide research-based, up-to-date, and unbiased information to stakeholders and clients at low or no cost.

The AIAI-FTFD Start-to-Finish Teaching Model can act as an educational model to assist Extension educators as they provide trainings and disseminate information on communication skills. In this study, the model's effectiveness as an instructional tool has been evaluated through its use in teaching the *9 Important Communication Skills for Every Relationship (9 Skills)*.

9 Important Communication Skills for Every Relationship

Larson and Holman (1994) have identified *interactional processes* as the most predictive factor of relationship satisfaction and quality when compared with *individual couple traits* and *context* (Larson, 2003). Gottman, Coan, Carrere, and Swanson (1998) identified gentleness, soothing behaviors, and de-escalation of negativity as the key factors in successful positive interaction. They found little or no support for the technique of active listening as a successful strategy for positive interaction. Similarly, no support was found for expressing anger or negative affect reciprocity as a deterrent to positive communication behaviors. Balance theory was cited as an explanation for the need to balance negative interactions with positive interactions. According to Gottman (1994b), the optimal ratio of positive to negative interactions is 5:1.

Gottman (1994b) identified four negative behaviors that act as a deterrent to positive communication: criticism, defensiveness, contempt, and stonewalling. *Criticism* involves attacking someone's personality, usually with blame and accusation. *Defensiveness* involves not accepting responsibility for behaviors. *Contempt* includes communication behaviors such as rolling the eyes, mocking, sarcasm, name-calling, and other verbal and non-verbal expressions. *Stonewalling* occurs when someone refuses to communicate by using the silent treatment.

Five healthy communication and conflict resolution behaviors that promote positive interaction have also been identified (Gottman, 1994a): calm down, I-messages, speak non-defensively, validate, and overlearn the other eight skills. *Calm down* involves disengaging from a potential negative interaction before something hurtful is said and should endure for at least 20 minutes or longer to ensure that a person has really calmed down. Otherwise, it becomes easy to slip back into an emotionally-charged conversation and to say or do things that are hurtful.

According to Gottman (1994b), bringing up a *complaint* about a specific issue or behavior is one of the healthiest behaviors in which individuals can engage because it allows resentment and frustration to become a venue for expression and discussion. Skillfully using “I messages” when bringing up a specific complaint is a particularly positive method of facilitating positive interaction and avoiding criticism. It includes beginning with the statement “I feel...” and then identifying a *behavior* and a *reason* why this behavior has become a frustration.

Individuals who acquire and use the skill of *speaking non-defensively* tend to speak with gentleness and positivity, avoid using criticism and contempt, and elicit trust from the listener without eliciting defensiveness. *Validating* others requires not only tracking the communication of the speaker through head nods, short statements, and eye contact, but also requires giving full attention to the speaker and seeking to understand the emotions and needs that are being communicated. Ultimately, the art of validation involves the ability to engage in perspective-taking and empathic behaviors. *Overlearning* these skills refers to learning all eight communication skills so well that they become a part of an individual’s regular interaction repertoire (Gottman, 1994b).

Objectives

Transforming target skills into learning objectives is an important key to employing best practices in teaching (Gagné et al., 1992; Harris et al., 2014). The objectives identified for this study using the AIAI-FTFD method correspond to core goals of the *9 Skills* training. The objectives of the *9 Skills* program include:

Objective 1. Participants will increase their levels of understanding (knowledge) about the factors associated with healthy communication and conflict resolution patterns using the *9 Skills* that can help them reduce the risk for negative outcomes.

Objective 2. Participants will demonstrate increased changes in levels of confidence (attitudes) about their abilities to use the *9 Skills* to strengthen their communication and conflict resolution skills, and therefore reduce the impact of potential risk on themselves and their relationships.

Objective 3. Participants will demonstrate positive levels of intent to implement the *9 Skills* (behaviors) to increase positive interaction, decrease negative interaction, increase positive bonds, and increase satisfaction and well-being, four primary indicators of healthy relationship stability and success (Harris, 2014b; Harris et al., 2012).

Purpose

The purpose of this study was to evaluate an ongoing Extension educational program, designed using the AIAI-FTFD Start-to-Finish Teaching Model for human services educators (Harris et al., 2014), as a potential model for employing effective teaching as an intervention in Extension educational programming. The research question that drove this exploratory study was, “What are the cognitive, emotional, and intent to change behavioral learning outcomes generated by employing the AIAI-FTFD teaching model as an intervention in designing, delivering, and evaluating the *9 Important Communication Skills for Every Relationship (9 Skills)* program?”

Methods

This study represents an expansion of previous studies of the AIAI-FTFD teaching model (Harris et al., 2010, 2014). The authors used a self-report quantitative evaluation method across an array of program contexts to study the effectiveness of the AIAI-FTFD teaching model in an Extension learning environment among participants who completed the *9 Skills* training. The sample, research design and sampling method, and data collection and analysis are discussed below.

Sample

The sample in this study was drawn from participants ($n = 152$) in a Southeastern state who voluntarily completed a 1.5- to 2-hour Extension program titled, *9 Important Communication Skills for Every Relationship*. The *9 Skills* program was adapted from Dr. John Gottman’s (1994a, 1994b) research for use in an Extension learning environment. A majority of subjects who participated in this study were White, female, below age 29 or above age 50, and single or married. Most participants made less than \$40,000 a year or more than \$60,000 per year and had an Associate’s Degree or higher (see Table 1). Sample data for the *9 Skills* variables being studied was not included in this study unless it was generally complete. Specifically, in several cases where one or two data points were missing, the overall mean for the variable was calculated by reducing the n to those who had completed the questionnaire item and then averaging the overall scores to determine the overall mean.

Missing demographic information is identified in Table 1. The type of venue where collecting demographic data was not warranted nor desired by the training participants was generally the reason behind why missing data occurred. As noted in Table 1, the most common underreported

demographic data were age and ethnicity. Because this was an IRB-approved study, participants received a letter of information clearly informing them that participation in the program and the follow-up survey were strictly voluntary and that any survey item they did not want to complete was strictly at their discretion.

Table 1. Demographic Description of 9 Skills Participants (N = 152)

Characteristics	n	%	Characteristics	n	%
<i>Gender</i>			<i>Education Level</i>		
Female	116	76	Less than high school	5	3
Male	25	16	High school graduate/GED	38	25
Missing Data	11	8	Associate's Degree	42	28
<i>Age</i>			Bachelor's degree	30	20
14-19	8	5	Graduate degree	25	17
20-29	34	22	Missing Data	10	7
30-49	11	7	<i>Ethnicity</i>		
50-59	9	6	White	72	47
60-69	22	15	Black	15	10
70 and above	21	14	Hispanic/Latino	17	11
Missing Data	47	31	Asian/Pacific Islander	4	3
<i>Marital Status</i>			Native American	0	0
Single	57	38	Other	3	2
Married	44	29	Missing Data	41	27
Divorced	9	6			
Partnered (Cohabiting)	6	4			
Widowed	22	15			
Separated	2	1			
Missing Data	10	7			
<i>Income Level</i>					
< \$20,000	42	28			
\$20,000-\$39,999	28	18			
\$40,000-\$59,999	19	13			
\$60,000-\$79,999	13	8			
\$80,000 or more	27	18			
Missing Data	23	15			

Research and Curriculum Design and Delivery

The research design used for this IRB-approved study was a self-report quantitative exploratory cross-sectional design using a purposive sampling method. The *9 Skills* curriculum used in this study was adapted from Gottman (1994a, 1994b) and was specifically designed for an Extension

environment in order to employ best practices in program design, implementation, and evaluation (Powell & Cassidy, 2007) using the AIAI-FTFD teaching model (Harris et al., 2014). The AIAI-FTFD teaching model was included in the notes section of the *9 Skills* PowerPoint used to deliver the curriculum with embedded accompanying teaching strategies, instructional methods, and questioning techniques. A full description of the curriculum is not possible within the context of this article, but readers who wish to view a version of the curriculum can find it on the eXtension website at <https://learn.extension.org/events/1354>. The curriculum was generally administered in either a one-time 1.5- to 2-hour session or in two separate 45-minute to 1-hour sessions. No compensation was awarded for participation in the study.

Data Collection and Analysis

A one-time retrospective pre-then-post paper-and-pencil survey instrument was administered to assess participants' knowledge, confidence, and intent to change behavior at the end of the *9 Skills* program. Only eight of the nine skills were evaluated in the current study due to the difficulty in assessing the ninth skill of overlearning the other eight skills. A five-level Likert scale providing a range of responses (*strongly agree, disagree, neither agree nor disagree, agree, and strongly disagree*) was used to assess knowledge of the eight skills and level of agreement with statements such as "I understand how to avoid using criticism" and "I understand how to validate others" (see Table 2). Similarly, confidence in applying and using the eight skills was assessed using statements such as "I am confident I can avoid becoming defensive" and "I am confident I can speak non-defensively." Intent to change behavior was assessed using four statements targeting decreasing negative interactions, and increasing positive interactions, positive bonds, and satisfaction or well-being.

A retrospective pre-then-post survey instrument design was intentionally used as a good fit for the *9 Skills* Extension programming in order to evaluate learning outcomes both before and after the program for several reasons, as reviewed in Marshall, Higginbotham, Harris, and Lee (2007) and summarized below.

The experimental pretest-posttest design using a control or comparison group is considered to be one of the most respected methods that can be used to measure change in individuals (Campbell & Stanley, 1966; Kaplan, 2004). This design is highly regarded because of its control over internal validity concerns and ability to compare results from the same people or groups of people at multiple time points.

While there are advantages to using the pretest-posttest method, there are some limitations with this method, as well. One limitation comes with finding an adequate comparison group, which can be difficult or impossible for researchers to locate. Another limitation concerns the possible lack of resources and time available for community-based programs to complete comprehensive

pretest-posttest comparisons (Brooks & Gersh, 1998). Also, in order for the pretest-posttest comparisons to be meaningful, participants must attend the complete program from start to finish (Pratt, McGuigan, & Katzev, 2000). Due to the nature of community education programs, attrition and sporadic attendance may commonly cause issues (Pratt et al., 2000).

While the pretest-posttest information must be complete for comparisons to be made, it may be challenging for researchers to see the actual changes in attitudes, behaviors, or skills if the participants overstate their original attitudes, behaviors, or skills when completing the pretest (Howard & Daily, 1979). This overestimation may occur when the participants do not have a clear understanding of the attitudes, behaviors, or skills that the program is targeting (Pratt et al., 2000). A lack of knowledge on certain topics (e.g., attitudes, behaviors, skills) often supports the initial need for a program intervention, but this same issue may show participants during the course of the program that they actually knew much less than they thought when they completed the pretest. Thus, one must be aware of the potentially misleading information from pretest-posttest comparisons due to the participants' change in frame of reference over the course of the program (Howard & Daily, 1979). "Response shift bias," first referred to by Howard and Daily (1979), explains the "program-produced change in the participants' understanding of the construct being measured" (Pratt et al., 2000, p. 342). Response shift bias, along with the issues noted previously, should be examined when reviewing findings from pretest-posttest comparisons.

Effect size. The data were analyzed using descriptive statistics and paired sample *t*-tests. Effect sizes were calculated in order to evaluate the standardized mean differences before and after the program for each variable being studied. Focusing on effect size rather than statistical significance helps researchers determine the magnitude of standardized mean differences for a given sample and for specific identified variables. Cohen (1988) loosely characterized effect sizes as small ($d = >.20$), medium ($d = >.50$), and large ($d = >.80$). Further, Cohen (1988) identified a small effect size as a *meaningful* mean difference, a medium effect size as a *noticeable* mean difference, and a large effect size as a *clearly-evident* mean difference (Howell, 2002). Because it is difficult to separate program pedagogy from content, the authors of this study determined that using effect size to evaluate standardized mean differences from before and after the *9 Skills* program implementation was a viable first step to exploring and assessing the effectiveness of the AIAI-FTFD teaching model in facilitating change in an Extension learning environment.

Results

Results of the design, implementation, and evaluation of the *9 Skills* program using the AIAI-FTFD teaching model as an intervention generally ranged from noticeable to clearly-evident reported standardized mean changes specific to each variable being studied (see Table 2).

Table 2. Results of 9 Skills Evaluation Before and After Programming (N = 152)

		Retrospective Pretest Mean Score (SD)	Posttest Mean Score (SD)	Mean Change (SD) (Pooled SD)	t	P	Cohen's d (Effect Size)
<i>Knowledge Change</i>							
1	I understand how to avoid using criticism.	3.34 (.87)	4.28 (.76)	.94 (1.01) (.82)	11.55	.000***	1.14
2	I understand how to complain using I-messages.	2.88 (.99)	4.87 (.99)	.99 (.96) (.99)	12.77	.000***	1.00
3	I understand how to avoid contempt.	3.23 (.91)	4.22 (.73)	.99 (1.04) (.83)	11.87	.000***	1.19
4	I understand how to validate others.	3.52 (.95)	4.33 (.87)	.81 (1.02) (.91)	9.85	.000***	.89
5	I understand how to avoid defensiveness.	3.10 (.90)	4.04 (1.12)	.93 (1.36) (1.02)	8.50	.000***	.91
6	I understand how to speak non-defensively.	3.27 (.97)	4.20 (1.03)	.93 (1.27) (1.0)	9.03	.000***	.93
7	I understand how to calm down.	3.39 (1.21)	4.23 (1.14)	.84 (1.27) (1.18)	8.23	.000***	.71
8	I understand how to avoid stonewalling.	3.03 (1.18)	4.03 (1.18)	1.00 (1.40) (1.18)	8.86	.000***	.85
9	Overall, I understand how I can use the 9 Skills when communicating.	2.85 (1.31)	4.34 (.82)	1.49 (1.27) (1.09)	14.54	.000***	1.37
<i>Confidence/Attitude Change</i>							
13	I am confident that I can avoid using criticism.	3.17 (1.15)	4.18 (.91)	1.01 (1.05) (1.04)	11.92	.000***	.97
14	I am confident that I can use I-messages.	3.21 (1.15)	4.33 (.81)	1.12 (1.00) (1.00)	13.97	.000***	1.12
15	I am confident that I can avoid contempt.	3.14 (1.15)	4.19 (.84)	1.05 (1.12) (1.01)	11.66	.000***	1.04

16	I am confident that I can validate others.	3.42 (1.11)	4.40 (.74)	.98 (1.12) (.94)	10.88	.000***	1.04
17	I am confident that I can avoid becoming defensive.	3.06 (1.06)	4.18 (.82)	1.12 (1.09) (.95)	12.71	.000***	1.18
19	I am confident that I can speak non-defensively.	3.11 (1.01)	4.24 (.76)	1.14 (1.02) (.89)	13.79	.000***	1.28
21	I am confident that I can calm down.	3.48 (1.05)	4.37 (.86)	.88 (1.03) (.96)	10.64	.000***	.92
22	I am confident that I can avoid stonewalling.	3.14 (1.15)	4.24 (.90)	1.10 (1.11) (1.03)	12.29	.000***	1.07
23	Overall, I am confident in my ability to use the <i>9 Skills</i> when communicating.	2.79 (1.41)	4.20 (1.16)	1.41 (1.50) (1.29)	11.75	.000***	1.09
<i>Behavior Change (Intent)</i>							
25	I will use the <i>9 Skills</i> to increase positive interaction in my relationships.		4.40				
26	I will use the <i>9 Skills</i> to decrease negative interaction in my relationships.		4.36				
27	I will use the <i>9 Skills</i> to increase positive bonds (friendship) in my relationships.		4.44				
28	I will use the <i>9 Skills</i> to increase happiness and satisfaction (well-being) in my relationships.		4.46				

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Noticeable to approaching clearly-evident standardized mean changes were reported by participants in their understanding how to calm down when communicating, while clearly-evident standardized mean changes were reported by participants in their understanding of how to avoid criticism, defensiveness, contempt, and stonewalling and for how to speak non-defensively, validate others, and use I-messages. Overall, a large, clearly-evident effect size ($d = 1.37$) was reported by participants for perceived knowledge gain from before to after the *9 Skills* program.

Corresponding to confidence gained in using the eight identified skills in their relationships from before to after the *9 Skills* program, participants in this study generally reported clearly-evident confidence gains across all eight variables being studied, especially with regard to speaking non-defensively and using I-messages. Overall, participants reported a large, clearly-evident standardized mean change associated with confidence gain in their ability to use the *9 Skills* when communicating ($d = 1.09$).

Reported intent to change behavior data revealed mean scores ranging from 4.36 to 4.46 for decreasing negative interaction and increasing positive bonds, interaction, and well-being. Before and after program paired sample *t*-tests were not used for these four variables in this initial exploratory study due to the fact that some participants received the full program in only one setting, and as a result, assessing behavior change was not possible.

Discussion

Exploring the magnitude of the cognitive, emotional, and intent to change behavior learning outcome changes associated with employing the AIAI-FTFD teaching model as an intervention in designing, delivering, and evaluating the *9 Important Communication Skills for Every Relationship (9 Skills)* program was the purpose of this study. Because it is difficult in an Extension learning environment to implement true experimental or quasi-experimental designs, using a retrospective pre-test then post-test design is a practical option for Extension program evaluation given the inevitable challenges and constraints with this type of programming (Marshall et al., 2007).

The AIAI-FTFD teaching model was designed to facilitate the process of change in an instructional setting (Harris et al., 2014; Mace, 1981). Because the model is designed to facilitate change in the teaching of any content in any context, its theoretical foundation assumes that a majority of the measured change is due to the effective use of the model and not to the specific content or the context (Harris et al., 2014). It appears from the data in this study that the AIAI-FTFD teaching model may be a viable instructional method for facilitating meaningful, noticeable, and clearly-evident cognitive and emotional change and intent to change behavior (Cohen, 1988). However, the authors readily acknowledge that content and context do exert an influence on learning outcomes, but suggest that without engaging instructional delivery, this influence can be substantially weakened (Reiser & Dempsey, 2012; Vygotsky, 1978).

The analysis of cognitive (i.e., knowledge) standardized mean differences from before to after the *9 Skills* program indicated that participants generally reported a medium, approaching large, clearly-evident increase in their understanding of how to calm down when communicating. Participants also reported large, clearly-evident standardized mean difference increases in each

of the other seven variables, especially in their reports of their overall understanding of how to use the knowledge gained from before to after the *9 Skills* program to communicate effectively.

Additionally, participants reported large, clearly-evident gains in their ability to apply (i.e., confidence) all eight skills being measured to their own circumstances, especially in the area of speaking non-defensively. Similarly, their overall reported confidence in their ability to use the eight skills when communicating indicated a large, clearly-evident effect, as a result of the *9 Skills* program. The reported cognitive and emotional (i.e., confidence) gains also resulted in reported high mean levels of participants' intent to change behavior in order to increase positive interaction, positive bonds, and happiness/satisfaction (well-being) and to decrease negative interaction.

The AIAI-FTFD teaching model requires instructors to identify cognitive, emotional, and behavioral target skills prior to teaching, to operationalize them into objectives, and then to map them throughout the teaching preparation and delivery process in order to maximize participant learning outcomes. Providing participants with an opportunity to practice the cognitive, emotional, and behavioral target skills within the learning environment and a way to continue to practice them through homework or using a tracking chart outside of the learning environment is one way the AIAI-FTFD teaching model assists instructors to facilitate meaningful change and maximize potential learning outcomes. The application of this model is shown specifically through the results described above regarding the *9 Skills* curriculum and training.

Marshall (Harris, 2010) has indicated that ignorance (lack of appropriate knowledge), incompetence (lack of appropriate skills), and resistance to conscience (an unwillingness to use appropriate knowledge and skills) are three primary impediments to change. As a result, instructors' intentional targeting of knowledge, application, and skills throughout the learning process is key to increasing positive learning outcomes. While many models of learning and instruction target knowledge, application, and skills as important learning outcomes, few, offer a specific methodology to design, implement, and evaluate these outcomes in an easy-to-learn and start-to-finish way for educators. Educators across multiple disciplines who have used and mastered the AIAI-FTFD teaching methodology have reported meaningful qualitative gains in their teaching effectiveness and in learner outcomes (Harris et al., 2014). The current study adds some initial quantitative evidence to the existing literature that the AIAI-FTFD teaching model may be effective in facilitating change in an Extension learning environment among Extension educators and clients.

Limitations and Implications

Limitations of this study include the one-time, cross-sectional design. It was not possible to assess how robust the self-reported changes in knowledge, confidence, and intent to change

behavior were given the design. A cross-sectional evaluation and three-month follow-up evaluation of the *9 Skills* curriculum has recently been conducted with another sample. Knowledge, confidence, and behavior change results were analyzed and will be reported in an upcoming study to assess the robustness of the AIAI-FTFD teaching model in facilitating programmatic change over time using the *9 Skills* curriculum.

Additionally, the theoretical foundation of the model was developed for the teaching of any content in any context, so it assumes that a majority of the measured change is due to the effective use of the model and not to the specific content or the context (Harris et al., 2014). Due to the design of the study and absence of a comparison group, it cannot be determined how significantly the content and context of the *9 Skills* training may have influenced the outcomes reported related to the teaching model. The authors readily acknowledge these factors may affect learning outcomes and that further study is needed using longitudinal and comparative designs.

Another limitation of this study is the self-report nature of the survey instrument. Self-report can provide both advantages and disadvantages in conducting research. Advantages include the ease and lack of expense associated with conducting research, as well as the ability to assess individual perceptions about certain constructs and variables. Disadvantages include multiple cognitive and situational internal validity issues, such as history, selection, and response bias. Additionally, external validity issues also exist. Therefore, the results in this study, as with most exploratory studies, must be interpreted with caution.

Conclusions

This study represents an ongoing attempt to explore how the AIAI-FTFD teaching model can be used to facilitate change in an instructional setting. Results of this study indicate that the AIAI-FTFD teaching model did not inhibit but may have facilitated change in cognitive, emotional, and behavioral learning outcomes among participants in this study. These initial results offer potential future directions for study of the AIAI-FTFD model, including longitudinal evaluations and follow-up studies across different contexts and subject areas. Using the model to design, implement, and evaluate programming represents another tool in the toolbox educators can use to intentionally pursue effective instruction and programming in an Extension environment.

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