Promoting Older AA Use of Technology to Support Diabetes Self-Care

Flint and Detroit, Michigan, USA

American Public Health Association (APHA) 2018 Annual Meeting and Expo

San Diego Convention Center, San Diego, California

Session: 5059.0 Technology and Aging; Program: Aging & Public Health

5059.0 11A SDCC - November 14, 2018, 10:50 AM – 11:10 AM
Charles Senteio, PhD, MBA, LMSW (Principal Investigator)
Denise Soltow Hershey, PhD, RN, FNP-BC (Co-Investigator)
Terrance Campbell, MA Ed (Co-Investigator)

Presenter Disclosures

Charles Senteio

No Relationships to Disclose.

Older adult African Americans and Diabetes Disparities

- African Americans aged 45+ **are twice as likely** to have diabetes when compared to Whites[1]

- **30%** of all African Americans between 65 – 74 have diabetes[1]

- Among all diabetics, African Americans are **twice as likely** to experience diabetes-related blindness and amputations, and **2 - 6 times** more likely to have Chronic Kidney Disease[2]

Barriers to Technology to Support Self-Management

- African Americans more frequently have **low health literacy** which is associated with poor outcomes from **traditional diabetes self-management programs**[1]

- 66% of **all older adults** report difficulty in **using** and **interpreting** health information[3-5]

- Self-care intervention efficacy **enhanced** by use of ICTs[6]

- Low SES elders **less likely** to have internet **access**, a **positive predictor** of SNS use – an increasingly important **resource for** self-management (health information, social support)[7,8]

Older adult AAs experience barriers to access technology designed to support diabetes self-management

Accessibility Limited by Requisite Skills to Routinize Use of ICTs to Support Self-Care

- Use of **mobile apps** to support self-care across 4 areas: **Rx** behaviors (e.g., alerts), tracking of **physical activity**, **dietary** choices, **appointment** reminders

- Use of ICT-enabled **glucometers** and **pedometers**

- Use requisite **hardware** (wearable, smartwatch, tablet, laptop)

- Seeking and interpreting **online** health information
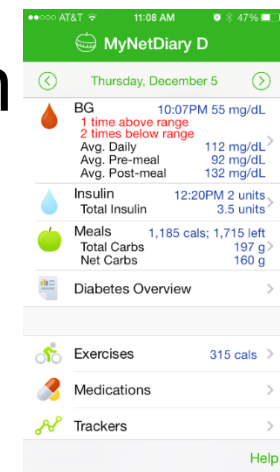
Emerging Insights on Intergenerational Technology Skills Transfer–Reciprocal Learning

- Intergenerational technology activities facilitate learning for both young adults and elders for **skills required** to use **ICTs** to support **self-care**[9] …

  o Leading practices include activities to focus on new **skills**, rather than differences based upon **age** or technology **competencies**

- … yet **little** is known of its applicability to support diabetes self-care for populations plagued by persistent disparate higher incidence and poor outcomes

Opportunity to Address Barriers Through Intergenerational Technology Skills Transfer

Specific Aims and Research Questions

- Specific Aims

  1. Develop diabetes **self-care *seminar*** using a proven intervention for increasing health literacy for similar participant population

  2. Document **factors** which promote intergenerational technology transfer in support of diabetes self-care for selected participant population

- Research Questions

  1. What is the level of **digital knowledge**, **technology readiness**, and **self-efficacy** for older adult African Americans (≥50), with respect to managing their chronic condition (diabetes)?

  2. What **impact** can young adults have on older adult AAs' perception of: relevance, knowledge, and self-efficacy concerning technology skills, access, and resources that can support chronic disease self-care?

> **We conducted *design sessions* with older adult African Americans in Flint and Detroit, then conducted a pilot in each city - insights used to finalize the seminar.**

Mixed methods study informed by models of technology acceptance and use

- Community-based participatory research (**CBPR**) approach to community health informatics with **participatory design**[10,11]

- Informed by the **socio-ecological model of health** and the Senior Technology Acceptance and Adoption Model (**STAM**)[12]

- Recorded the design and pilot sessions and performed **thematic analysis** on the qualitative data

- Pre-session and post-session questionnaires were administered and **compared** to test the **impact of the intervention** in enhancing diabetes self-management skills

- Distribution of the data was tested for normality first, and based on the test result a **non-parametric test** (Kruskal-Wallis) was employed to compare the responses.

- The comparison test was performed for the older adults and young adults **groups individually**, as well as for the **entire sample**

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Five Step Study – 2 Sites, Flint & Detroit, MI

HOPE Party
- Attend HIV/AIDS prevention and information sessions (**H**IV/STI **O**utreach, **P**revention, **E**ducation)
- Experience community-based health education sessions

Design Sessions
- Attend design sessions
- Created **D-Party** ("D" for diabetes)

Pilot
- Participants attend **pilot session** for "member checking". Finalized (3 hour "**D-Party**")

D-Party
- Conduct **4 D-parties**, 2 in Flint, 2 in Detroit

Phone Interview
- Telephone **interviews** with D-Party participants after one month

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Participants at each of the Five Steps

Step	Site – Date (location)	Number of Participants
1) **HOPE Party** (N=29)	Flint - 12/27/2016 (Church)	• **14**: 6 older adults, 8 young adults
	Detroit - 12/28/2016 (Technology Center)	• **9**: 8 older adults, 1 young adult
	Detroit - 1/21/2016 (Older Adult Public Housing Facility)	• **6**: 6 young adults
2) **Design Session** (N=11)	Flint - 2/18/2017 (Church)	• **6** "designers": 3 older adults, 3 young adults
	Detroit - 2/17/2017 (Older Adult Public Housing Facility)	• **5** "designers": 3 older adults, 2 young adults
3) **Pilot Session** (N=14)	Flint - 4/1/2017 (Church)	• **6**: 3 older adults, 3 young adults
	Detroit - 4/1/2017 (Older Adult Public Housing Facility)	• **8**: 4 older adults, 4 young adults
4) **D-Party** (N=66)	**Flint AM** – 5/20/2017 (Church) **Flint PM** – 5/20/2017	• **27**: 17 older adults, 10 young adults • **14**: 5 older adults, 9 young adults
	Detroit AM – 5/21/17 (Older Adult Public Housing Facility) **Detroit PM** – 5/21/2017	• **11**: 7 older adults, 4 young adults • **13**: 9 older adults, 4 young adults
5) **Phone Interview** (N=18)	Flint & Detroit **–** June 20th – July 11th, 2017	• **3:** 1 older adults, 2 young adults • **15:** 10 older adults, 5 young adults

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AIM 1: Intervention Design (D-Party)

- Should target a **mixed** group of participants – elders and youth, those with and without diabetes

- Should address **both** 'diabetes 101', and technology overview and exercises

- Participants likely will have smartphones, but use them **primarily as phones**

- Technology exercises should be driven by pairs **themselves**, **demonstrate** use

"… keep it **mixed** so that we can [share] information from the horse's mouth and provide information to … people that don't have [diabetes]."
~ Detroit, #6 ~

… limit it to pretty much, to you know, **cell phones**. Don't nobody have a tablet … you know, we who are older, we want to **keep it simple** … one device [phone] to help our health. I just can see the value of getting some of this stuff figured out. I mean maybe **I'll learn** how to download an app!"
~ Flint, #3 ~

Quotes from *design sessions* with elders in Flint and Detroit – insights used for the pilot – then to finalize the seminar, the *D-Party*.

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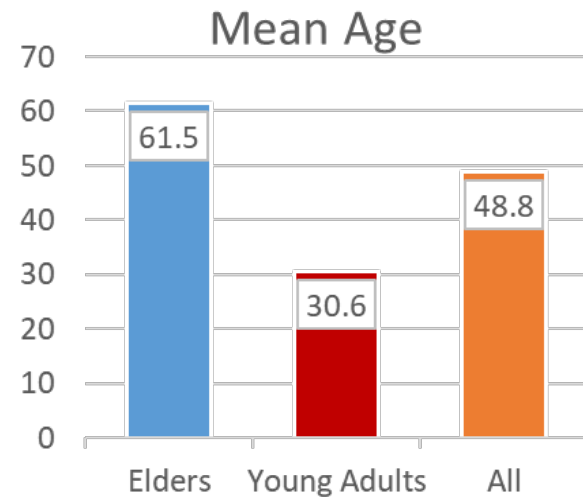# AIM 2: Factors promoting intergenerational technology skills transfer

- Conducting technology skills transfer should emphasize pace of learning - **patience** level

- Consider physical **limitations** (i.e., eyesight, operating on relatively small screens) and/or **reading** levels

- Demonstrate **one skill** (e.g. download and use a phone app) in small groups (pairs/triads)

"… somebody that's gonna, you know … [have] **patience** with us because we might not pick it up fast."
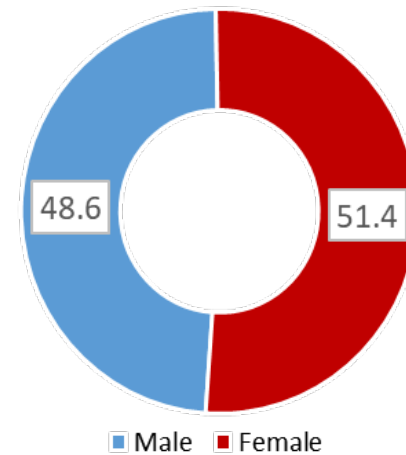~Flint, #5~

"you gotta find a young person who is **interested** … those who have helped you in the past, or [are] just **interested in you**."
~Flint, #3~

"a **demonstration** is definitely helpful … a demonstration [for the] phone [would increase] interest."
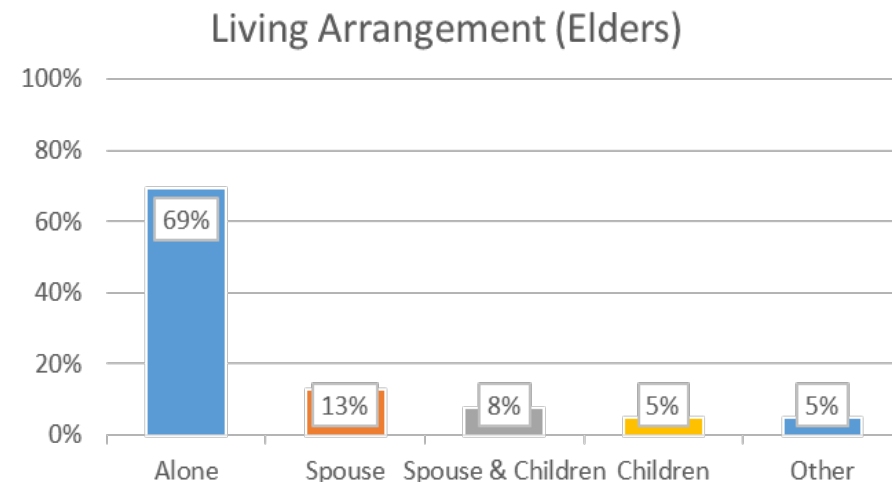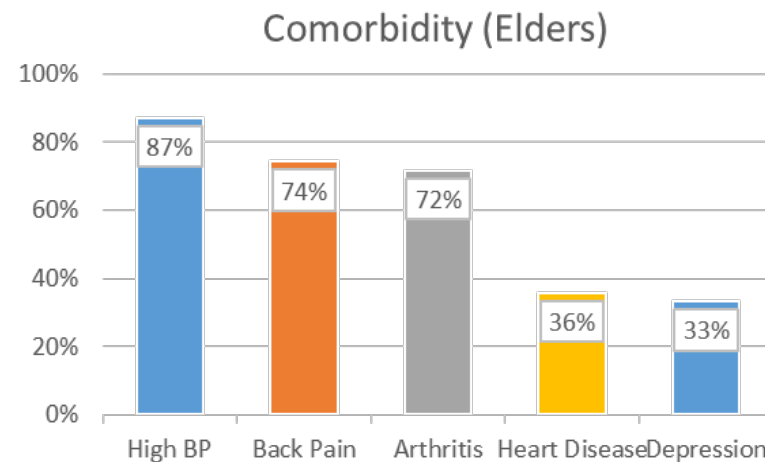~Detroit #6~

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D-Party Participants – N=66
(39 Older Adults, 27 Young Adults)

Mean Age
- Elders: 61.5
- Young Adults: 30.6
- All: 48.8

Gender - Elders
- Male: 48.6
- Female: 51.4

Gender – Young Adults
- Male: 37.0
- Female: 63.0

Comorbidity (Elders)
- High BP: 87%
- Back Pain: 74%
- Arthritis: 72%
- Heart Disease: 36%
- Depression: 33%

Living Arrangement (Elders)
- Alone: 69%
- Spouse: 13%
- Spouse & Children: 8%
- Children: 5%
- Other: 5%

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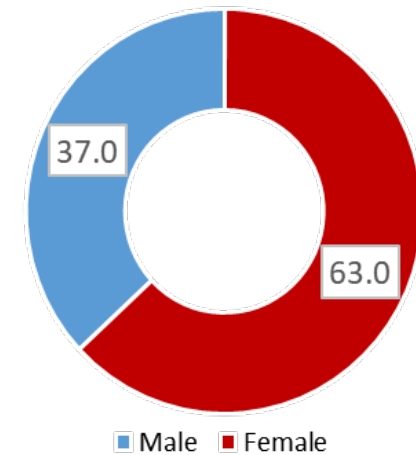
D-Party Impact – Sample (N=66), Older Adults (N=39) & Young Adults (N=27)

Statistically Significant Difference For 3 Groups (p<=0.01)

Variable	Statement
1	I can get the help I need to use technology to help me with my health.
2	I can download a health app.
3	I like when others help me use technology.

Statistically Significant Difference For Elders (p<=0.01)

	Pre-test		Post-test					
v.	M	SD	M	SD	N	95% CI	t	Df
1	3.61	1.05	4.21	0.78	38	0.2318, 0.9261	3.38	37
2	3.29	1.23	3.85	1.09	38	0.1619, 0.8907	2.93	37
3	3.84	0.87	4.15	0.71	37	0.1070, 0.4876	3.17	36

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D-Party Follow Up Phone Interviews

- Completed D-Party **Follow-up Phone Interviews** with 18 D-Party participants (from June 20th – July 11th, 2017)

- **Survey responses** to Self-Efficacy Questions (Likert): questions specific to Older Adults – learning about tech from Young Adults – and Young Adults – learning about health from Older Adults

- **Open ended** responses aimed to asses perceptions/actions since the D-Party

- Most participants were overwhelmingly **complementary** of the D-Parties, several asked us when we would be doing them again

Themes: Older Adults

Like the learning

I **like working with young people.** I learned about Facebook at the D-party, by working **together with young people** (Detroit PM – P5)

I **loved the seminar**, would love more. (Detroit AM – P8)

We **learned from each other**. I like that. I would enjoy another seminar whenever it comes. **It's like a prayer meeting.** (Detroit PM – P4)

It was beneficial. Someone else described things that I also experienced. I'm **not the only one** going through this. (Detroit PM – P7)

Learned about technology and diabetes, and want to learn more.

At D-party, people **showed me how to go to the store to download an app**. I used a health app about diabetes **after the D-party** (Detroit PM – P4)

I'm **taking a basic computer class now** at DPL [Detroit Public Library]. It started 2 weeks ago, it's going to run for 4 weeks. It's a library class with people at my age (63). Then I'll **go to an advanced class** for 4 more weeks. (Detroit PM – P2)

She [daughter] **showed me** on my phone, how to Google and download an app about all kinds of medication. I was able to do that **on my own** after the D-Party. (Detroit PM – P7)

Before I didn't know about medication, what to eat. Haven't used a website. But **learned how to sign up for email** and learned how to use it. (Detroit PM – P4)

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Themes: Young Adults

Working with Relatives Since the D-Party

I was with my mom. **I showed her the Internet** on her phone. (Detroit AM – P11)

[Since the D-Party] I've **showed [my mom] how to use** WebMD to check muscle pain. We sit together, working on the phone. A little more work would help her to do that **on her own**. (Detroit PM – P10)
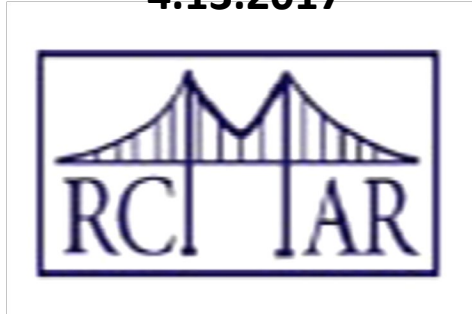
Tips on how to teach older adults

Young people need to be patient, take your time. Make sure they understand before you move on. **Have them to do it themselves** see if they can pull it off. (Detroit AM – P11)

Young people need to be **more willing to be patient**. I want to be a participant for next seminar. (Detroit PM – P10)

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Conference Presentations (7)

4.13.2017

8.8.2018

2017 & 2018

11.5.2018

11.14.2018

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Peer reviewed journal articles (4)

1. Senteio, C. R. (2018). Investigating the Enduring Impact of a Community-Based Health Education Program to Promote African American Elders' Use of Technology Designed to Support Chronic Disease Self-Management. **Geriatrics**, *3*(4), doi:10.3390/geriatrics3040070

2. Senteio, C. R., Soltow Hershey, D., & Campbell, T. R. (2018). Diabetes Education and Intergenerational Technology Transfer: African American Elders Using Technology to Support Diabetes Self-Management. **Gerontechnology** *17*(suppl), 139s. doi:10.4017/gt.2018.17.s.135.00

<u>Revise and Resubmit</u>

1. Senteio, C. R., Soltow Hershey, D., Campbell, T. R. & Mandal, S. (2018). *Intergenerational Technology Transfer: Enhancing African American Elders' Self-Efficacy for Diabetes Self-Management*. Manuscript Submitted to *Gerontologist* for Review on July 6th. Received good feedback, editor recommended submitting to **Innovation in Aging**. Currently making revisions to submit.

2. *Promoting elder African Americans' use of technology to support diabetes self-care*. Senteio, C. R*,* Soltow Hershey, D., & Campbell, T. R. – "Methods" paper that **received Honorable Mention for the (APHA) Betty J. Cleckley Minority Issues Research Award from the Aging in Public Health Section**. Currently formatting for submission to **Journal of Aging and Health**

Next Steps

- Used insights from participatory design to inform **study design** for NIH/NCI career development award ("K01") to support African American prostate cancer survivors use of technology for self-care - submitted 10/2018.

- Advanced discussions with national non-profit and Foundation to **incorporate D-Parties** into existing "health classes"

Team and Acknowledgements

Charles Senteio, PhD, MBA, LMSW –
Principal Investigator
charles.senteio@Rutgers.edu
Assistant Professor Rutgers School of Communication & Information, Library and Information Science, New Brunswick, New Jersey

Denise Soltow Hershey, PhD, RN, FNP-BC – Co-Investigator
Denise.Hershey@hc.msu.edu
Assistant Professor, College of Nursing Michigan State University (MSU) E. Lansing, Michigan

Terrance R. Campbell - MA Ed, Co-Investigator, Deputy Director - YOUR Center – terrance.campbell@yc4w.org
Flint, Michigan Director, Community Engagement, Center for Information Assurance, University of Memphis

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References

1. Ziemer, D. C., Berkowitz, K. J., Panayioto, R. M., El-Kebbi, I. M., Musey, V. C., Anderson, L. A., . . . Phillips, L. S. (2003). A simple meal plan emphasizing healthy food choices is as effective as an exchange-based meal plan for urban African Americans with type 2 diabetes. *Diabetes Care, 26*(6), 1719-1724. doi:10.2337/diacare.26.6.1719

2. Ricci-Cabello, I., Ruiz-Pérez, I., Nevot-Cordero, A., Rodríguez-Barranco, M., Sordo, L., & Gonçalves, D. C. (2013). Health care interventions to improve the quality of diabetes care in African Americans: a systematic review and meta-analysis. *Diabetes Care, 36*(3), 760-768. doi:10.2337/dc12-1057

3. Dennis, S., Williams, A., Taggart, J., Newall, A., Denney-Wilson, E., Zwar, N., . . . Harris, M. (2012). Which providers can bridge the health literacy gap in lifestyle risk factor modification education: a systematic review and narrative synthesis. *BMC Family Practice, 13*(1), 44. doi:10.1186/1471-2296-13-44

4. Diamantidis, C. J., & Becker, S. (2014). Health information technology (IT) to improve the care of patients with chronic kidney disease (CKD). *BMC Nephrology, 15*(1), 7. doi:10.1186/1471-2369-15-7

5. Fernández-Ballesteros, R., Molina, M. Á., Schettini, R., & del Rey, Á. L. (2012). Promoting active aging through university programs for older adults: An evaluation study. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry, 25*(3), 145-154. doi:10.1024/1662-9647/a000064

6. Sarkar, U., Fisher, L., & Schillinger, D. (2006). Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? *Diabetes Care, 29*(4), 823-829. doi:10.2337/diacare.29.04.06.dc05-1615

7. Kim, H. H., & Seo, H. J. (2014). HealthTWITTER initiative: design of a social networking service based tailored application for diabetes self-management. *Healthcare Informatics Research, 20*(3), 226-230. doi:10.4258/hir.2014.20.3.226

8. Yu, R. P., Ellison, N. B., McCammon, R. J., & Langa, K. M. (2015). Mapping the two levels of digital divide: Internet access and social network site adoption among older adults in the USA. *Information, Communication & Society*, 1-20. doi:10.1080/1369118X.2015.1109695

9. Ghosh, R., Lindeman, D., Ratan, S., & Steinmetz, V. (2014). The new era of connected aging: A framework for understanding technologies that support older adults in aging in place.

10. Spinuzzi, C. (2005). The Methodology of Participatory Design. *Technical Communication, 52*(2), 163-174.

11. Muller, M. J., & Druin, A. (IN PRESS). Participatory Design: The Third Space in HCI.

12. Renaud, K. and J. van Bijon, *Predicting Technology Acceptance and Adoption by the Elderly: A Qualitative study*, in *SAICSIT 2008*. 2008, ACM 978-1-60558-286: Wilderness Beach Hotel, Wilderness, South Africa