

Explaining African-American Cell Phone Usage Through the Social Shaping of Technology Approach

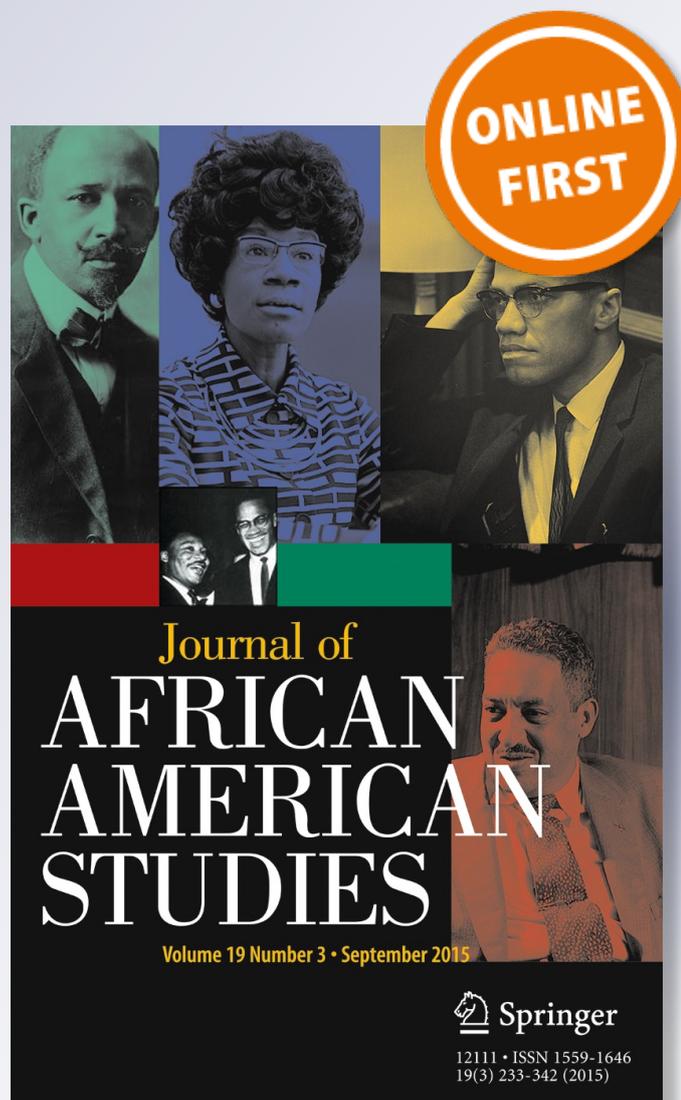
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Journal of African American Studies

ISSN 1559-1646

J Afr Am St

DOI 10.1007/s12111-015-9317-x



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Explaining African-American Cell Phone Usage Through the Social Shaping of Technology Approach

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Abstract African-Americans have been understood to be on the wrong side of the “digital divide”. Yet, African-Americans exhibit high rates of cell phone usage. This study attempts to explain this trend by applying a social shaping of technology approach. High rates by African-Americans are hypothesized to be powered by the cultural expectations of communicating with family and friends. Using nationally representative data, several conclusions were drawn. First, African-Americans have higher rates of cell phone usage for calling and texting, but not Internet usage. This holds after controlling for various factors associated with cell phone usage. Second, there is evidence that the high rate of usage by Hispanics is also grounded in cultural expectations. Finally, race and family structure interact to produce high rates of phone calling, but do not interact to produce high rates of texting.

Keywords Cell phone · Technology · African-American · Digital divide · Social shaping of technology · Mobile phone

Introduction

In 2010, the Pew Research Center issued a press release detailing findings from a survey on cell phone use in the USA. A major finding was that minorities are more mobile than whites:

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“Continuing a trend we first identified in 2009, minority Americans lead the way when it comes to mobile access—especially mobile access using handheld devices... minority Americans are significantly more likely to own a cell phone than their white counterparts (87 % of blacks and Hispanics own a cell phone, compared with 80 % of whites). Additionally, black and Latino cell phone owners take advantage of a much wider array of their phones’ data functions compared to white cell phone owners” (Smith 2010).

These findings run counter to prevailing understandings of information and communication technologies (ICTs) and race. Social science research and wider society has operated under the assumption that minorities are disadvantaged with respect to the acquisition and usage of ICTs. Early research had shown that minorities were slower to purchase computers and subscribe to Internet service—a phenomenon popularized as the “digital divide” (Attewell 2001; Kvasny 2006). Because barriers to ownership have decreased, in recent years, research has pointed to a skills divide between whites and minorities. This newer phenomenon has been called “digital inequality” (DiMaggio et al. 2004; Hargittai 2005, 2008). The disparities between ethnoracial groups are judged to be primarily because of underlying class differences (measured by occupation, income, or education) that are positively correlated with ICT ownership and skills.

The Pew Research Center’s findings require some explanation. The structural barriers faced by African-Americans and Hispanics have not changed appreciably since the early research on the digital divide. Although Hispanic phone usage will be discussed, this research will focus on providing an explanation primarily for African-Americans.

One potential explanation lies in the communication dynamics within the family. Research shows that the primary purpose of the cell phone—even in the age of smart phones that are as versatile as computers—is to communicate with family members (Hampton 2007; Ling 2008; Turkle 2011). African-American families, on average, are constituted differently than white families due to variations in marital rates and size of extended kin networks (Cherlin 2006; Hattery and Smith 2007; Hummer and Hamilton 2010). Moreover, research suggests differences in cultural patterns between cultures in a white and minority families (Stack 1974; Taylor et al. 2013), such that African-Americans families communicate and interact more with their extended kin. These differences in the family vis-à-vis culture may explain variations in cell phone usage. The question guiding this study is: Does being African-American, and more specifically the cultural pattern of maintaining ties with significant others, predict the higher rates of cell phone usage?

Theoretical Background

Social Shaping of Technology

In the broadest sense, social scientists are aware that different cultures use new media technology in varying ways to suit their needs (for cross-national examples see Albarran 2009; Rosenfeld and O’Connor-Petruso 2014; Choi and Im 2015). This broad understanding is given theoretical structure with the social shaping of technology perspective. The social shaping of technology perspective draws attention to the agency

people in determining how technology is used (Pinch and Bijker 1984; Fischer 1994; Warschauer 2003; Haddon 2004; Song 2009; Baym 2015). The social shaping perspective is a correction to technological determinism, or the belief that when a technology is introduced into society it shapes society in its image (see Smith and Marx 1994 for a collection of essays on technological determinism).

Some of the more prominent theories within this broad perspective include the social construction of technology (Pinch and Bijker 1984) and domestication of technology (Haddon 2004) approaches. The social construction of technology approach explores the role of “relevant social groups” in attaching meaning to a given technology and thus constructing how society understands and uses the technology (Bijker, Hughes and Pinch 1987). The domestication of technology approach orients the researcher to “... the processes shaping the adoption and use of ICTs, but in so doing also asked what the technologies and services mean to people, how they experience ICTs, and the roles that these technologies can come to play in their lives” (Haddon 2011, p. 312). The term domestication signifies a process through which a “wild” technology is appropriated by groups, eventually “tamed”, and employed to accomplish everyday activities. Newer variants within this tradition include the work on “digital practices” by Graham (2010, 2014), and the work on mobile phone culture by Goggin (2006). Graham’s “digital practice perspective” illustrate how social groups leverage new technologies to address structurally and culturally conditioned desires. Goggin (2006) applies a “circuit of culture” approach to the cell phone, positing a complex interplay between individual level factors or representation and identity, economic factors of production and consumption, and how the cell phone is regulated politically.

This perspective is applied to the current study in a straightforward way. The digital divide and digital inequality literature focuses primarily on how structural or social position factors effect cell phone usage—income and education, for example. By contrast, the social shaping perspective focuses primarily on cultural factors—perceptions and meanings. We suggest that it is cultural factors that form the foundation for the high rates of cell phone usage within African-American families.

Cell Phones and Communication within the Family

Castells et al. (2006) write: “an unprecedented phenomenon has emerged that almost all family members of a large number of households are networked at all times” (p. 89). This understanding of cell phone communication within the home has led to a number of studies exploring the ways that family members have used mobile phones within a family context (Ling and Yttri 2002; Devitt and Roker 2009; Madianou and Miller 2011; Carvahlo et al. 2015). A common thread connecting these studies is that cell phones are devices through which people maintain constant ties with family and close kin, a phenomenon Turkle (2011) calls “perpetual contact”. Moreover, cell phones do not alter existing social networks, but strengthen already developed ties between significant others (Hampton and Wellman 2003; Hampton 2007). In other words, the phone does not produce these relationships, but instead the relationships influence the phone use. We highlight a few of the studies on cell phone usage below.

Ling (2008) argues that the repeated use of a cell phone is not unlike a ritual used to cement bonds between people. The cell phone, he argues, extends the effects of rituals so that social cohesion can be maintained without actors being co-present—people can

maintain ties across space and time. Horst and Miller (2006) in their ethnography of low-income Jamaicans assert that “the phone has effectively usurped co-presence as the very experience of sociability simply because they could sense that by utilizing it they could extend their feelings of closeness and care” (p. 84). Boas (2008) embeds communication via mobile phones within a larger “personal communication system”, such that individuals with different compositions of social networks tend to use different forms of communication (e-mail, landline telephone, face-to-face communication). In a study mirroring the present one, his findings show that cell phone usage increases as the number of kin ties increase.

The purpose of discussing this literature is to identify a specific causal mechanism, one that is culturally based, for the relationship between African-Americans and phone usage. Prior research suggests that cell phone usage is strongly correlated with maintaining connections with significant others.

African-American Families and Communication

Scholars have documented the distinctiveness of African-American families (Cherlin 2006; Hattery and Smith 2007; Hummer and Hamilton 2010). One dimension of this distinction is its social networks and more importantly the cultural expectation to maintain these networks. Carol Stack (1974) wrote in *All Our Kin*, “The black urban family, embedded in cooperative domestic exchange, proves to be an organized tenacious, active, lifelong, network” (p. 124). Stack was commenting on the complex social network that is the African-American family, and the cultural expectation of maintaining and relying on these networks. More recent research shows that Stack’s observations in the 1970s are still relevant today (Cantor et al. 1994; Johnson and Barer 1990; Sarkisian and Gerstel 2004; McCreary and Dancy 2004). One of the more comprehensive studies exploring differences between African-American families and other families along a variety of measures, concluded that: “African-Americans gave assistance to their family members more often than non-Hispanic Whites, were more likely to have daily contact with their extended family members than non-Hispanic Whites and Black Caribbeans, and had more frequent interactions with their family than Black Caribbeans” (Taylor et al. 2013: 618).

While all ethnoracial groups use cell phones for communication with significant others, communication patterns within African-American families imply an even greater reliance on this technology. Cell phones can be leveraged to maintain the complex social networks that African-Americans are embedded in. Applying a social shaping perspective suggests that African-Americans would use cell phones more than whites in order to meet these expectations. Therefore, even with similar family sizes, similar family compositions, and similar sociodemographic profiles, African-Americans should use their cell phones for communication purposes more than whites.

Research Question

The question guiding this study is: Do the cultural expectations that African-Americans have of maintaining strong kin-networks explain their higher rates of cell phone usage?

Without data that measures cultural attitudes directly, we take an indirect approach. First, theoretical reasons must be put forth to explain the relationship (i.e. a causal mechanism). This was done above by using the social shaping of technology approach and the research on cell phone communication and African-American family patterns. Given what we know, we should expect African-Americans, compared to whites, to have higher rates of cell phone usage for communication purposes. Second, these higher rates should not extend to using the Internet. While communication can occur via the Internet applications (e.g., Facebook messenger), most communication with family members occurs via voice and text. There is little to suggest that African-Americans would use their cell phones more than whites for Internet usage. Third, as many alternative structural explanations as possible must be eliminated. It must be shown that sociodemographic variables such as age, income, education, and gender do not nullify the effect of being African-American. Similarly, it is well known that African-American family structure is different than white families. Therefore, being African-American must have an effect net of family composition. Overcoming these three hurdles in a statistical model lends strong support for the idea that it is the cultural expectations that African-Americans have of maintaining strong kin-networks that explain their higher rates of cell phone usage.

A comparison can be made to Hispanics. Like African-Americans, Hispanics have been characterized as being on the wrong side of the digital divide, but exhibit high rates of cell phone usage (Smith 2010). Indeed, as of 2010, Hispanics lead all ethnic and racial groups in the percentage who use only a cell phone and no longer own a landline phone (Dutwin et al. 2010). Moreover, there is evidence to suggest that Hispanics have similar cultural expectations of lending support to family and friends (Castillo et al. 2004; Gamoran et al. 2012; Salinas 2013). The studies that have been done show that Hispanics view cell phones as “positive and necessary” (Leonardi 2003) and that Hispanics in the USA, when compared to Hispanics in other countries, were the only ones who preferred using their cell phones for sharing social information with friends (Albarran 2009). A study of Latino day laborers in Seattle concluded that “mobile phones...provide day laborers the possibility of maintaining links to the daily lives of their far-away families and friends as well as links to the everyday news and culture of their home towns and countries” (Baron et al. 2014, p. 107). However, given the diversity of the Hispanic experience, a specific hypothesis about the particular ways in which cell phone communication is manifested within this broad category cannot be produced. Instead, exploring Hispanics provides a comparison to African-Americans and may provide general support for the social construction of technology assumption that higher cell phone rates are a product of cultural expectations.

Data and Methods

Data

The analyses presented here are based on data from the Pew Research Center’s Internet and American Life Project. The project’s mission is to explore the effects of the Internet on various aspects of social life. This survey was conducted from April 29, 2010, to May 30, 2010. This survey asks respondents standard sociodemographic variables and cell phone activities. Cell phone activities include calling (voice), texting, and using the Internet. The

total initial N for the sample was 2252. Because of missing cases, the N in models varied from 246 to 443. Weights supplied by the Pew Research Center were used for all analyses.

Independent Variables

Control Variables Socioeconomic variables previously shown to influence cell phone usage were included in models. More educated and higher income groups tend to be more adept at using technology (Hargittai 2008; Hargittai and Hsieh 2013). Age (Lorence and Park 2006; Xie and Jaeger 2008) and gender (Gefen and Straub 1997; Bimber 2000; Ono and Zavodny 2003; Koch et al. 2005; Willoughby 2008; Dixon et al. 2014) have also been identified as affecting the ownership and usage of ICT. This study will use education, income, employment status, gender, and age as control variables. For education, the reference group will be respondents with a high school diploma. For employment status, respondents who selected categories other than being employed full time or part time (e.g., retired, student, etc.) are the reference group. For gender, males are the reference group. The purpose of including these socioeconomic variables is to eliminate as many alternative explanations as possible. Descriptive statistics for this variable and all other independent variables are shown in Table 1.

Family Structure Variables Marital status, total household size, the number of children in the household under 12, and the number of children in the household between 12 and 17 are included in the analyses, acting as indicators of family structure. Total household size and the number of children are interval level variables. For marital status, respondents have been placed into four categories: married, living with partner, divorced–separated–widowed, and never married–single.¹ Being married is the reference group for this variable.

Ethnoracial Group The ethnoracial variable is measured as African-American, White, Hispanic, and Other with White as the reference category.

Dependent Variables

Mobile phone usage was measured in three ways:

- *How many phone calls do you make and receive on your cell phone?* [calling frequency]
- *On an average day, about how many text messages do you send and receive on your cell phone?* [texting frequency]
- *Using your cell phone, how often do you access the Internet?* [Internet frequency]

¹ The decision to create these particular marital status categories was born first out of practicality, and second by classifying based on commonality. Practically, the data set is too small to support an analysis of each marital status. Thus, marital statuses were classified based on commonality. Marriage, a family structure backed by the state and considered the norm for society, will be analyzed separately. People who are divorced, separated, and widowed share the fact that they were once married. These statuses are combined into a second category. People who are living with partners (cohabitating) are similar to married couples. However, research shows that both in objective outcomes (Cohan and Kleinbaum 2002) and subjective perceptions (Nock 1995), cohabitation is seen as distinct from marriage. Thus living with partner is a third category. Finally, people who have never been married and people who are single are combined into a final, fourth category.

Table 1 Univariate statistics ($N=2,252$)

Independent variables				
Variable	Frequency (%)			
Education				
Less than high school	12.6			
High school	32.0			
Technical/vocational school	2.3			
Some college	24.7			
College graduate	18.4			
Post graduate degree	10.0			
Employment status				
Employed full time	44.7			
Employed part time	13.0			
All else	42.3			
Ethnoracial group				
White	70.6			
African American	11.9			
Hispanic	11.4			
Other	6.2			
Marital status				
Married	52.0			
Living with partner	7.2			
Divorced, separated, or widowed	19.2			
Never been married or single	21.0			
	Mean	SD	Min	Max
Income ^a	4.89	2.37	1	9
Age	46.9	19.3	18	99
Household size	2.17	0.88	1	6
No. of children under 12	1.28	1.0	0	6
No. of children 12–17	0.57	0.57	0	4
Dependent variables				
	Mean	SD	Min	Max
Calling frequency	3.38	1.70	0	7
Text messages	3.19	1.72	0	7
Internet frequency	4.01	2.23	0	6

^a Income: 1=less than 10,000, 2=10,000–20,000, 3=20,000–30,000, 4=30,000–40,000, 5=40,000–50,000, 6=50,000–75,000, 7=75,000–100,000, 8=100,000 and over

The values for calling frequency and texting frequency were not normally distributed, and had to be recoded from 0 to 7, with 7 being the highest frequency (see Appendix, Table 5). For Internet Frequency, the responses were: 0=“never”, 1=“less often [than every few weeks]”, 2=“every few weeks”, 3=“1–2 days a week”, 4=“3–5 days a week”, 5=“about once a day”, 6=“several times a day”. Univariate statistics for these variables are listed in Table 1.

Method

First, bivariate statistics are presented demonstrating the differences between ethnoraical groups, family structure, and cell phone usage. Second, regression models are presented that predict the three cell phone frequency variables. These models tease out the effect of race controlling for other variables. Third, a classification and regression tree analysis (CART) will be run to look at the interaction between ethnoraical group and family structure. CART analysis is a non-parametric statistical procedure that produces sub-groupings of respondents who are homogeneous with respect to a dependent variable (Brieman et al. 1984). CART determines which combination of characteristics (in this case racial group and family structure) classifies a given set of cases (in this case, survey respondents) into homogenous groups with respect to the dependent variable (in this case, a certain score on cell phone usage variables).

Analysis

Bivariate Statistics

Table 2 shows the means for the three measures of cell phone usage by ethnoraical group. *F* tests show significant differences for voice and text, but not Internet usage. African-Americans and Hispanics have higher frequencies of calling and texting. For Internet frequency, Hispanics have higher rates than other groups.

Regression Models

Table 3 presents the results of regression modeling. We focus on the control variables first, with the main conclusion being that sociodemographic variables have effects on cell phone usage. Given the wealth of research pointing to this conclusion, this is an expected finding. Age is negatively related with all three measures, with young people using their cell phones more than older people. For gender, men tend to make more phone calls, and women tend to send more texts. For income, there is a positive relationship with text messaging and Internet frequency. Education has statistically significant, but differing effects. With high school education as the reference group, respondents with lesser education tend to be more frequent texters, while respondents

Table 2 Means for cell phone activities by ethnoraical group

Ethnoraical group	Phone calls***	Text messages***	Internet access
White	3.13	3.02	3.91
African-American	4.13	3.64	3.91
Hispanic	4.17	3.61	4.44
Other	3.47	3.28	4.17
Total	3.39	3.20	4.01

F test significance * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 3 Regression models for phone usage (betas in parenthesis)

	Calling frequency <i>N</i> =443	Texting frequency <i>N</i> =378	Internet frequency <i>N</i> =246
Control variables			
Age	-0.035 (-0.223)***	-0.072 (-0.435)***	-0.060 (-0.266)***
Female	-0.179 (-0.057)**	0.399 (0.126)***	-0.211 (-0.048)
Income	-0.019 (-0.029)	0.092 (0.137)***	0.202 (0.214)***
Education (reference=HS diploma)			
Less than HS	0.090 (0.017)	0.095 (0.017)	0.505 (0.071)*
Technical/Trade/Vocational School	0.117 (0.009)	1.29 (0.088)***	0.967 (0.053)
Some college	0.293 (0.079)**	-0.218 (-0.061)*	1.18 (0.234)***
Bachelor's	0.053 (0.014)	-0.079 (-0.021)	1.31 (0.253)***
Post graduate	0.506 (0.099)***	-0.574 (-0.115)***	1.16 (0.167)***
Employment status (reference=all else)			
Full time	0.657 (0.204)***	-0.060 (-0.018)	0.255 (0.056)
Part time	-0.309 (-0.068)**	0.025 (0.005)	0.065 (0.008)
Family structure variables			
Marital status (dummy=married)			
Living with partner	0.621 (0.097)***	0.525 (0.085)***	0.222 (0.028)
Divorced/separated/widowed	0.374 (0.080)**	0.653 (0.139)***	0.573 (0.092)**
Never married/single	0.305 (0.057)*	-0.098 (-0.019)	0.473 (0.072)*
Household			
Total household size	0.108 (0.051)**	0.183 (0.091)***	0.068 (0.024)
No. children under 12	0.039 (0.025)	0.072 (0.044)	0.016 (0.008)
No. children between 12 and 17	0.164 (0.081)**	0.220 (0.108)***	-0.163 (-0.057)
Ethnoracial variables (reference=White)			
African American	0.599 (0.128)***	0.432 (0.096)***	-0.356 (-0.061)*
Hispanic	0.310 (0.071)**	0.047 (0.011)	0.454 (0.080)**
Other	-0.208 (-0.030)	0.281 (0.041)	0.681 (0.070)*
Constant	4.33	4.46	4.05
Adjusted <i>R</i> ²	0.143	0.250	0.160

p*<0.05 *p*<0.01 ****p*<0.001

with higher education make and receive more phone calls and access the Internet more frequently. Employment status has an effect on phone call frequency, with full time workers using the cell phone significantly more than those who are out of work, but part time people using their cell phones significantly less.

Moving to family variables, for both calling and text, being in a larger home (measured by household size), and having teenagers (measured by number of children between 12 and 17) are associated with higher rates of phone usage. For example, each unit increase in household size is associated with an increase of 0.108 for calling and 0.183 for texting. The effect is stronger for number of children between 12 and 17, 0.164, and 0.220, respectively. Looking at the particular family composition, we see

that being married is generally associated with a decrease in cell phone communication. This relationship holds for all marital statuses. For Internet frequency, a non-communicative measure, household size has no effect, but family composition does. Respondents in the divorced/separated/widowed category and the never married/single category are associated with increased frequencies of Internet usage (0.573 and 0.473, respectively). Moreover, these effects are equally strong for marital status.

We now move to the effect of being African-American. We can test the hypothesis that controlling for sociodemographic variables, African-Americans will have higher rates of cell phone usage for communication purposes, but not for other purposes. For both phone calls and text messages—phone activities that are primarily communicative, being African-American is associated with an increase in the frequency of these activities. Specifically, the effect associated with being African-American is 0.599 for calling frequency and 0.432 for texting frequency. These effects are of a relatively high magnitude. Consider the parameter estimate of 0.599 for calling frequency. Only living with a partner (0.621) and working full time (0.657) have stronger effects. Similarly, the parameter estimate of 0.432 for texting frequency is strong, with some education and employment variables having stronger effects. In order to support the claim that this effect holds only for communicative purposes, we turn to the model predicting Internet frequency. There was an effect associated with African-Americans; however, being African-American was associated with a *decrease* in Internet frequency by a magnitude of -0.356 as compared to whites. Given the positive effect of being African-American for communication, but the negative effect for Internet usage, the hypothesis is supported.

We also wanted to explore cell phone usage among Hispanics. Like African-Americans, Hispanics are frequent users of cell phones compared to whites. However, the dynamics of this use are different. Like African-Americans, being Hispanic has a positive effect on calling frequency. The magnitude of the effect is smaller, with African-Americans being associated with a 0.599 increase while being Hispanic is associated with a 0.310 increase. For the other two measures—texting frequency and Internet, Hispanics and African-Americans diverge. Unlike African-Americans, there is no significant difference between Hispanics and whites with respect to texting. For Internet usage, the effect of being Hispanic is associated with an increase of 0.454, while being African-American is associated with a decrease. This result is the opposite of what was found in a study of black youth, who were more likely to use the Internet than Hispanics (Tynes and Mitchell 2013; Lee 2014). However, these studies were restricted to teenagers. These findings suggest that the form of cell phone usage for Hispanics is of a different character than that of African-Americans. However, like African-Americans, cultural expectations are still the most likely explanation.

Race and Family Interactions

Although the hypothesis has been supported and a clarification of the cell phone usage patterns between African-Americans and Hispanics has been made, a corollary question can be asked about race and family: because both family and race matter in cell phone communication, do they work together to effect rates of cell phone communication? A standard way to address this question is to run interaction terms in regression models. However, because of the number of possible interactions a more parsimonious and interpretable method is CART analysis. CART models were constructed for calling

and texting (Table 4). To simplify the analysis only ethnorracial and family variables are included. Also the variable “children under 12 years old” was not included as it was not significant in the preceding regression analysis. The CART procedure creates a hierarchy of scores based upon interactions between family structure and ethnorracial group.

Phone Call Frequency For phone call frequency, a central theme is the importance of marital status and minority status in producing groups with high phone call frequencies. First, the interaction that creates the highest phone call frequency is *married* African-Americans and Hispanics with household sizes greater than 2. This grouping has an average score on the phone frequency scale of 4.87. Group 3, another high-frequency group, is also composed of married minorities, only with household sized less than or

Table 4 CART analyses predicting phone calls and text messaging using ethnorracial group and family structure

Phone call frequency				Text messaging frequency			
No.	Characteristics	Pct. of sample	Mean	No.	Group	Pct. of sample	Mean
1	<ul style="list-style-type: none"> • African-American/Hispanic • Married • Household size>2 	1.9 %	4.87	1	<ul style="list-style-type: none"> • Never married or single • Household size>1 	21.0 %	4.37
2	<ul style="list-style-type: none"> • African-American/Hispanic • Never married or single 	9.9 %	4.42	2	<ul style="list-style-type: none"> Married/divorced, separated, or widowed African-American/Hispanic/ other no children between 12 and 17 	5.1 %	3.59
3	<ul style="list-style-type: none"> • African-American/Hispanic • Married • Household size≤2 	6.5 %	3.91	3	<ul style="list-style-type: none"> • Living with partner • Household size>1 	8.5 %	3.57
4	<ul style="list-style-type: none"> • White/other • Living with partner 	6.1 %	3.74	4	<ul style="list-style-type: none"> • Never married or single/ living with partner • Household size=1 	7.1 %	3.18
5	<ul style="list-style-type: none"> • African-American/Hispanic • Divorced, separated, widowed 	4.9 %	3.64	5	<ul style="list-style-type: none"> Married/divorced, separated, widowed African-American/Hispanic/ other children between 12 and 17>0 	13.0 %	2.86
6	<ul style="list-style-type: none"> • White/other • Married/never been married or single/divorced, separated, or widowed • Household size>2 	16.6 %	3.31	6	<ul style="list-style-type: none"> • Married/divorced, separated, widowed • White 	45.2 %	2.61
7	<ul style="list-style-type: none"> • White/other • Married/never been married or single/divorced, separated, or widowed • Household size≤2 	54.1 %	3.00				

equal to 2. Marriage on the other hand, depresses the calling frequency for whites. For example, whites who are living with a partner—group 4, have mean phone calling frequencies of 3.74, while whites who are married occupy the two lowest strata, groups 6 and 7. These two groups have mean phone calling frequencies of 3.31 and 3.00.

Texting Frequency For texting frequency, a central theme is that unlike phone frequency, there is less interaction between race and family structure in producing distinct groupings by texting frequency. This is especially so in the higher strata. The most frequent texters, in group 1, are those who are single but do not live alone. This large group, 21 % of the population, is most likely made up of young people who live with roommates and also single parents. Groups 3 and 4 are also based solely on family composition. As with phone frequency, being white is associated with lower frequencies of phone usage. Moreover, family composition has little influence on this. Whites, of all family compositions, make up the grouping with the lowest texting frequency, group 6 with a mean texting frequency of 2.61.

Discussion

This study was undertaken in an effort to understand the aggressive use of cell phones by African-Americans. Using a social shaping of technology approach, this study looked for evidence to answer the question: Do the cultural patterns that African-Americans have of maintaining strong kin-networks explain their high rates of cell phone usage? Results from regression models suggest that this is the case.

African-Americans, controlling for other socioeconomic factors, exhibit higher rates of cell phone usage for communication controlling for other factors. For both phone calls and text messages—phone activities that are primarily communicative, being African-American is associated with an increase in the frequency of these activities. Applying a social shaping approach, we argue that this effect is powered by the meanings that African-Americans attach to communicating with family. Attitudes and beliefs could not be directly measured. However, given what is known in the literature and the elimination of alternative explanations, the unique family culture of African-Americans appear to be the most viable answer.

Although Hispanics were not the focus of this study, their high rates of phone usage made for an interesting comparison. In the main, after controlling for sociodemographic variables, Hispanics were still associated with higher rates of cell phone usage. Thus, cultural meanings—and not strictly structural causes—are at the heart of this usage. However, because the magnitude and direction of the effect of being Hispanic is different than that for being African-American, we suggest that the cultural meanings associated with the cell phone are of a different nature. Understanding how Hispanic cultural interplays with mobile phone technology present a unique challenge, given the variations of experiences within the Hispanic population (e.g., different national origins, different immigrant statuses—day laborer, first- or many-generation immigrant). These findings provide a foundation for future research.

Given the strong effects of family and race on regression models, two CART analyses were done for calling frequency and texting frequency. The main conclusions

were that race and family interact to produce higher rates of calling, but do not interact for texting. And interestingly, for calling, it is married minorities that exhibit the highest frequencies. This may say something about communication within married minority couples, and presents another area for future research.

Conclusion

Aside from the directions of future research discussed above, this research is an avenue into a wider critique about the assumptions held about race and technology. Digital divide and digital inequality arguments tend to dominate scholarly and lay discussions about minorities and their place in the information society. These discussions are important, but tend to neglect the agency that minorities have in appropriating and leveraging new technologies. Whites are understood to be the “haves”, and minorities the “have-nots”. Yet, here is a case where African-Americans and Hispanics are the “haves”. They possess the cultural motivations necessary to apply this technology aggressively in the accomplishment of everyday goals. Scholars need to explore in more detail the particular attitudes, beliefs, and meanings shared by African-Americans toward cell phones and apply them to groups who could benefit by using this technology more.

Compliance with Ethical Standards

Conflict of Interest The authors declare no conflict of interest.

Appendix 1

Table 5 Transformations for phone calls and text messages

Calling frequency			Texting frequency		
Percentile	Range	Coding	Percentile	Range	Coding
5	0	0	5	0	0
10	1	1	10	1	1
25	2–3	2	25	2	2
50	4–5	3	50	3–10	3
75	6–12	4	75	11–30	4
90	13–25	5	90	31–100	5
95	26–41	6	95	101–200	6
100	42 and over	7	100	Over 200	7

For making phone calls the respondent was asked: *How many phone calls do you make and receive on your cell phone?* The range for this variable was 0 to 500. The mean was 13.10, with a standard deviation of 28.4

For sending text messages, the respondent was asked: *On an average day, about how many text messages do you send and receive on your cell phone?* The range for this variable was 0 (minimum) to 500 (maximum). The mean was 39.10, with a standard deviation of 89.9. The raw numbers for both making phone calls and sending texts were transformed into ordinal variables that produced more interpretable results. Each variable was cut into eight units cut at the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles

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