

Minority Status and the Search for Health Information:  
A Test of the Social Diversification Hypothesis

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#### **Abstract**

To test the diversification hypothesis, which argues that disadvantaged groups in society will be more likely to use the Internet and computer mediated communication to access health information to compensate for their lack of social capital, we examined differences in how various groups search for health information. Data were gathered from a sample of Internet users representative of the percentage of minorities in the general population in Israel (n=1371). The results provide partial support for the hypothesis, indicating that in multicultural societies disadvantaged groups are more motivated than the majority group to use the Internet to access medical information. In addition, we found that accessing health and medical information affects changes in health behaviors. Our findings suggest that minority groups that do not have access to specialized networks use the Internet to overcome their lack of access to specialized information. Implications of the findings are discussed.

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#### **Introduction**

The Internet has emerged as a valuable source for acquiring health information and health services. According to recent surveys, 61% of adults in the United States (Fox & Jones, 2009) and 52.2% in Europe (Kummervold et al., 2008) look online for health information. In 2007, an estimated 46.8% of the population in Europe saw the Internet as an important source of health information (Kummervold et al., 2008). Not only is the Internet an important source for accessing health information, but it is also an important channel for communicating about issues, linking individuals in need of specific information and support with similar others and health care professionals. In the United States, 18% of Internet users say they have gone online to find others who have health concerns similar to theirs. In Europe, 7.4% of the population reported having approached a family doctor, specialist, or other health professional via email or the Web (Fox, 2011; Santana et al., 2010). The emergence of the Internet as an important tool for health communication and information requires an in-depth understanding of the social factors associated with its use, the effects on health related behaviors and the implications for existing social inequalities in access to health information and health services.

Multicultural societies are characterized by the existence of various social groups that hold different positions in the stratification system (natives, immigrants and disadvantaged minorities). As access to the Internet is becoming universal, we must determine if the use of information and communication technologies (ICT) for health purposes varies according to these groups' differential position in society and their ethnic background (Ono & Savodny, 2008; Ono & Tsai, 2008; Pena-Purcell,

2008). This study investigates the use of the Internet to access information and communicate with others about health in a multicultural society (Israel). In particular, the study examines the similarities and differences in this use among a disadvantaged minority (Arabs), relatively recent immigrants (from the former Soviet Union) and the native majority. In doing so, we expand on previous studies, suggesting a comprehensive conceptual framework (i.e., the diversification hypothesis) for understanding the association between social standing and the use of ICT to access health information and discuss health issues. Furthermore, previous studies on Internet use for accessing health information have focused on the correlates of seeking health information, but did not address how looking for information about health is associated health management (see Anker, Reinhart & Feeley, 2011 for a comprehensive review). This study tests its hypotheses using a unique representative sample of adult Internet users (n=1398). This study attempts to answer the following research questions: Are there differences in the manner in which social groups of various background origins use the Internet to find information and communicate with others about health issues? To the extent that these differences exist, are they associated with the varying social position of these groups in society? Finally, are the search for information about health issues and communication with others about them associated with changes in health behaviors?

### **Theoretical Background and Hypotheses**

#### **The First-Level and Second-Level Digital Divide**

As Internet access has increased in Western countries, the literature on digital inequality has moved from a focus on the first to the second level of the digital divide (DiMaggio, Hargittai, Celeste, & Shafer, 2004; Hargittai & Hinnant, 2008). Early studies centered on the socio-economic determinants of physical access to

information and communication technologies (ICTs), focusing generally on reporting differences in access according to income, education, gender and ethnicity (DiMaggio, Hargittai, Shafer & Celeste, 2004; Katz & Rice, 2002; Korup & Szydluk, 2005; Ono & Zavodnik, 2008). However, as Internet access is reaching saturation in Western countries, more scholars are calling for a shift to the study of the second level, moving from examining the extent and causes of differences in ICT access to differences in types of use (Hargittai, 2002; Hargittai & Hinnant, 2008; Ono & Tsai, 2008). While inequalities in access have not completely closed, this study is part of the research on the second level of the digital divide.

### **ICT and Inequalities in Health Care**

The relevant literature makes two alternative and contradictory predictions. According to the "normalization hypothesis," the rise of the information society and the adoption of the Internet have the capacity to reduce existing social inequalities. In affluent post-industrial societies the social profile of the online community will gradually broaden over time (van Dijk, 2005). On the other hand, the "stratification hypothesis" argues that the process of ICT adoption replicates existing social inequalities, and may even exacerbate them. In the early and middle stages of technology adoption, adopters are more likely to be from groups with higher income, education and technical skills. With time, the skills required for taking real advantage of the technology become more demanding and adopters will face new access barriers (van Deursen, van Dijk, & Peters, 2010; van Dijk, 2005).

### **Accounting for Differences in Use: The Social Diversification Hypothesis**

In this study we draw on the diversification hypothesis as a tool for explaining the differential use of ICT based on people's position in society. The literature on social stratification maintains that multicultural societies are segregated according to

ethnic and social class lines (Lin, 2001). In societies that reward individuals differentially according to income, prestige and power, stratification systems limit their residential choices. Given that various social services are allocated according to place of residence, people's choices in terms of access to health information and health services are limited to the ones that exist in their residential locations (Feld, 1981; Massey, 2007). According to the diversification hypothesis (Mesch, 2007, 2011) computer mediated communication provides a vehicle for overcoming existing social inequalities in access to information and social networks that result from residential segregation in society. Residential and social segregation prevents members of minority groups from creating interactions across ethnicity and migration status. As a result, segregation reduces their access to social networks that enhance access to information on health related conditions (Ono & Tsai, 2008; Pena-Purcell, 2008). A study on ethnic differences in access to health information in the United States found that Hispanics reported a high level of agreement with the statement that the Internet is a helpful resource for health information, despite the fact that the odds of accessing health information were lower for Hispanics than for non-Hispanic whites (Pena-Purcell, 2008). Only 35% of Hispanics get consumer health information from the Internet compared to 71 % of non-Hispanic whites in the U.S. (Livingston, Minushkin, & Cohn, 2008). Similarly, Lorence, Park and Fox (2006) investigated ethnic, racial and income differences in access to online health information and found more evidence for socio-economic differences. Low income Hispanics had the lowest level of access to health information. Race was found to have little effect on the use of computers, the Internet, and online health information, when annual income levels were adjusted. Thus, while the motivation and need for accessing health information exists, apparently there are other barriers to achieving this goal. Accordingly, the

diversification perspective maintains that disadvantaged groups (due to migration status and ethnicity) will use the Internet to diversify their sources of information and social networks through computer mediated communication. In contrast, majority groups will use the Internet to maintain their existing levels of information, for example, through interpersonal communication and direct communication with health care providers.

In societies that are heavily segregated according to ethnic lines, group differences in access to health services may develop because health care services tend to be provided according to residential location. A study that investigated the characteristics of consumers of health information online found that the price of alternative sources of health information relative to the price of obtaining information on the Internet affects the demand for health information. Consumer health information served as a substitute for health information from health care practitioners when the time and distance associated with a face-to-face visit with a physician was much higher than the one associated with accessing health information over the Internet (Bundorf, Wagner, Singer & Baker, 2006).

In Israel, there are inequalities in the use of health care services based on ethno-national origin. Arabs are more likely to visit a family physician than Israeli Jews. At the same time, they are less likely than Israeli Jews to visit a specialist and more likely to be hospitalized (Baron-Epel, Garty & Green, 2007). These differences cannot be explained by insurance factors because all Israeli residents are covered by the National Health Insurance Law, which provides universal health care coverage. A study about health care after the enactment of the law reported that most of the Arab population (99.1%) had a regular family physician (Farfel & Yuval, 1999). However there are still structural barriers that might explain differences in access to services.

While primary services are available in Arab localities, specialist clinics are more likely to be located in the large cities. Thus, Israeli Arabs must cope with geographic and language barriers. Sometimes they have to travel an hour each way to Jewish cities where specialized clinics are located, losing work and having to pay for transportation costs (File, 2010).

Following this argument, this study expects that

*H1: Members of the majority (Israeli-born Jews) will be less likely than immigrants from the former Soviet Union (FSU) and Israeli Arabs to use the Internet for accessing health information.*

### **Internet Use and Changes in Health Care Behavior**

A central component in the link between media and changes in health behavior is the ability of the channel to persuade the Internet user to change his or her attitudes and behavior (Cassell, Jackson, & Chevront, 1998). Such change is accomplished through computer-mediated communication such as participation in forums and communicating by email with physicians and health care workers (Cassell et al., 1998). At the same time, the Internet is a mass communication channel that facilitates access to websites providing medical information. Thus, according to this view, both Internet functions (communication and information) promote changes in health behaviors (Cassell et al., 1998).

Following this argument, this study expects that

*H2: Immigrants and members of minority groups are more likely than members of the majority to change their health habits as a result of the health information they accessed through the Internet.*

*H3: Controlling for socio-economic status, ethnic origin and status as an immigrant, individuals reporting greater use of the Internet to communicate about health issues*

and to seek medical information will be more likely to report changes in health behavior.

### **Additional Factors Associated with the Online Search for Health Information**

There is some evidence that ethnic differences in patterns of ICT use remain after controlling for socio-economic factors. A study that focused on individuals with access to the Internet reported that ethnic and racial differences in use remained even after measures of socio-economic status were controlled. The study, which focused on patterns of ICT use in ethnic neighborhoods in the Los Angeles area, found that while socio-economic factors explained access, ethnicity was a unique contributing factor to Internet connectedness (Kim, Jung, & Ball-Rokeach, 2007). Other factors that must be considered are age, gender, motivation, income and education.

*Age* is a proxy for Internet skills. Studies have shown that the elderly perform more poorly than younger people in operating the Internet browser, finding search machines and navigating the Internet (van Deursen, van Dijk & Peters, 2010). Moreover, health usually deteriorates with age, so age might be an important motivation for seeking health related information and engaging in health related discussions (Bundorf, Wagner, Singer & Baker, 2006). For these reasons, in our analysis we controlled for age.

*Gender.* Previous studies have shown that women are more likely to search for health related information online (Flynn, Smith & Freese, 2006; Ybarra & Suman, 2006). It is very likely that this effect reflects traditional gender role models that place higher expectations on women for providing care to family members.

*Motivation factors.* The presence of children at home is regarded as a motivation for searching for medical information and was controlled for in the study. The health status of the respondent is also considered a motivating factor for such

searches. Previous studies have shown that those who report having a chronic illness are more likely to seek medical information online and participate in health related forums (Fox, 2011).

*Income.* Studies on inequalities in access to online health information found that racial differences were less salient than socio-economic differences. For both whites and African Americans, the likelihood of accessing health information online was inversely associated with income (Lorence & Park, 2008). Consistent with this finding, a recent study found that ethnic differences in the motivation for using social media persisted after controlling for socio-economic factors (Mesch, 2011).

*Education.* Health literacy broadly refers to the ability to understand medical information including drug prescriptions, the etiology of diseases and the outcome of various health related behaviors. Understanding the health information that is accessed online by visiting a web site or by participating in a health related virtual community requires the cognitive skills to decipher medical terminology and language. While we did not measure health literacy directly, it is widely accepted that education is a proxy for the cognitive skills needed to search for and evaluate health and medical information. Therefore, we controlled for education in this study.

Finally, recent studies have raised the possibility that health related Internet use might be displacing health professionals (Lee, 2008; Tustin, 2010). The basic argument is that a lack of confidence in health professionals or a lack of patient satisfaction may be the motivation for searching for health related information online and participating in health related forums (Tustin, 2010). For this reason, in this study we controlled for satisfaction with health professionals.

### **Minorities and Health in Israel**

Israel is a multi-ethnic society; 79% of the population is Jewish, the remainder is Arab. Israeli Arabs are a distinctive minority who have a different language (Arabic), profess a different religion (the vast majority are Muslims) and preserve an autonomous cultural existence through a network of institutions (separate schools and religious institutions, mass media and a highly cohesive family) (Smootha, 1997). Israeli Arabs are full citizens of Israel, but are also politically marginalized and economically disadvantaged relative to Jews (Haberfeld & Cohen, 2007). The Arab population resides in peripheral areas of the country and in small localities in which they form the great majority of the population (Ali, 2006).

Another important group in the Israeli population is immigrants from the countries of the former Soviet Union (FSU). The large wave of immigration started after 1989, shortly after the dissolution of the Soviet Union. Since then, one million immigrants from the FSU have arrived in Israel, constituting 15% of the total population and 20% of the Jewish population. The spatial distribution of the immigrants in the country is uneven, and they have become the majority of the population in many towns on Israel's periphery (Al-Haj, 2004).

### **The Penetration of ICT into Israel**

In Israel, Internet use is rapidly expanding. Overall, 71% of the Jewish population reports access to the Internet, but only 50% of the Arab population does so (Central Bureau of Statistics, 2008). The ethnic gap in Internet access is wider for low-income individuals of both groups and narrower for those with more than a high school education (Central Bureau of Statistics, 2008). Studies have concluded that the reasons for poor access to the Internet access and its minimal use by the Arab population are structural barriers associated with their disadvantaged status in society (Ganayem, Rafaeli & Azaiza, 2009; Mesch & Talmud, 2011). The multi-ethnic nature

of Israeli society along with a high level of residential and social segregation of Arabs and immigrants make Israel a perfect setting for conducting this study.

## **Method**

### **Design and Procedure**

Data for this study were collected in January 2010. A large representative sample of the population was extracted and 4,000 phone numbers were contacted with a response rate of 50%. The final sample included 2,000 respondents. Of them, 70% were Internet users (n=1371). Given that the major focus of this study is the use of the Internet for finding health information, the sample was limited to the sub-set of Internet users.

### **Sample**

The full sample consisted of 752 native Israelis, 252 immigrants and 367 Israeli Arab respondents. The average age was 43.04 years old (SD=15.81), 69% were married and 52% were women. In terms of education, the average years of schooling was 14.22 (SD=2.75). It is important to note that there are differences in the sub-set of Internet users based on their status as immigrants or members of a minority group. The average age of Israeli Jews was 45.9 years (SD=15.64), that of the immigrants from the former Soviet Union was 48.49 years (SD=15.47) and that of the Israeli Arabs was 33.15 years (SD=11.58;  $F=114.26, p < .01$ ). On average, Israeli Jews had 14.52 years of education, (SD=2.73) and immigrants from the FSU had 14.61 years (SD=2.56). For Israeli Arabs, the numbers were lower, with the average being 13.32 years of schooling (SD=2.73;  $F=27.37 p < .01$ ).

### **Measures**

#### *Dependent Variables*

*Searching for health information.* This variable was measured using a scale we created with seven items that asked respondents to indicate how often they have searched for information on the Internet about vaccines, high blood pressure, doctors, quitting smoking, diet, healthy food and protection from the sun. Responses were made on a 5-point Likert scale ranging from 1, indicating never, to 5, indicating very frequently. The scale's mean was 12.25 ( $SD= 4.89$ ,  $\alpha=.73$ ).

*Communicating about health.* Respondents were asked to indicate the extent to which they had participated in Internet forums about health issues or sent an e-mail to a physician or a nurse. Responses were made on a 6-point Likert scale ranging from 0, indicating never, to 5, indicating very often. The variables were combined in a single scale by summing up all of the responses ( $M=2.25$ ,  $SD=1.04$   $\alpha=.65$ ).

#### *Independent Variables*

*Ethnic group.* Respondents were asked for their country of birth. The answer "Israel" was cross-tabulated with an item eliciting the respondent's religion to yield two variables. Israeli-born and Jewish was coded as a dummy variable, and Israeli-born and Muslim, Christian or Druze was coded as a dummy variable. Immigrants were identified by means of two items. The first asked for the respondent's country of origin. Those answering "former Soviet Union" were identified. Then their year of immigration was determined and a dummy variable was created indicating FSU immigrants since 1989. The preliminary analysis showed that the great majority of immigrants (93%) belonged to this category. The other immigrants were excluded from the analysis because their number was very small.

*Age.* Age was a continuous variable.

*Gender.* Was measured by a dummy variable, with 1 indicating male and 0 indicating female.

*Education.* Was measured as a series of dummy variables: Elementary, high school, college and graduate school education. Elementary school was the reference category.

*Marital status.* "Married or living with a partner" was coded as 1, and "single or living alone" was coded as 0.

*Number of children.* Measured as a continuous variable.

*Satisfaction with physician.* Respondents indicated the extent to which they felt that their family practitioner explained their health conditions, respected the patient's complaints, spent time explaining things and involved the patient in his/her health. Responses were made on a 5-point Likert scale ranging from 1, indicating never, to 5, indicating always. The items were combined in a single scale ( $M= 16.78$ ,  $SD=3.82$ ,  $\alpha=.80$ ).

## **Results**

### **Descriptive Results**

We began testing our hypotheses by looking at differences in how the various groups searched for health information and the changes they reported in their health behavior. ANOVA tests for differences in the means were conducted. Hypothesis 1 expected that minorities and immigrants would be more likely to search for health information. The results indicated that while Israeli Jews and immigrants from the FSU scored an average of 11 on this scale, Israeli Arabs scored an average of 14.37 ( $F=8.59$ ,  $p < .01$ ), partially supporting hypothesis 1.

Hypothesis 2 expected that there would be differences in how ethnic groups and minorities search for information about health issues on the Internet and their use of the medium for communicating with others about these issues. Israeli Arabs scored an average of 3.83 on this scale, higher than the average reported by Israeli Jews

(3.32) and immigrants from the FSU (3.30). In addition, we found that without controls Israeli Arabs were more likely to report changes in health behavior ( $M=9.23$ ,  $SD=4.53$ ) than Israeli Jews ( $M=7.77$ ,  $SD=3.44$ ) and immigrants from the FSU ( $M=7.71$ ,  $SD=3.44$ ).

### **Results from a Multivariate Analysis**

The findings of a multivariate analysis are presented in Table 1. The results indicate support for H1. Israeli Jews and immigrants from the FSU are less likely to search for health information on the Internet or to use it for communicating with others about health issues. In contrast, Israeli Arabs (the omitted category) are more likely than Israeli Jews and immigrants to search for health information on the Internet or to use it for communicating with others about health issues.

[INSERT TABLE 1 ABOUT HERE]

One additional interesting finding is that satisfaction with one's physician is positively associated with both using the Internet to search for health information and using it to communicate with others about health issues. Thus, physicians and the Internet serve complementary functions, rather than the latter replacing the former.

H2 expected to find differences among the various groups in changes in health behaviors resulting from exposure to health information obtained through the Internet and communication with others online about health issues. Results are presented on Table 2. The results show that both immigrants and Israeli Jews are less likely to report having changed their health habits than Israeli Arabs.

[INSERT TABLE 2 ABOUT HERE]

H3 expected that, controlling for socio-economic status and ethnic/migration origin, individuals reporting greater use of the Internet for seeking health information and communicating with others about health issues would be more likely to report

changes in health behavior. When each one of the measures of exposure to communication or information online is added, the effect of ethnic or immigrant status is nullified. The results indicate that differences in the change in health behaviors do not result from differences between the groups, but are the result of differential exposure to health information and communication about health issues, even when we control for socio-demographic and other variables. This finding is significant in that it indicates that differences in changes in health behavior in various ethnic groups are the result of seeking information on the Internet.

### **Discussion**

The purpose of this study was to understand the factors associated with the search for health information online and its effects on health related behaviors, and how various ethnic and immigrant groups differ in these regards. In order to study these differences, we suggested using the diversification hypothesis, which maintains that disadvantaged groups take more advantage of the Internet as a means of overcoming social inequalities in society that limit their access to specialized information and services. A basic premise of the diversification hypothesis is that disadvantaged ethnic groups need to increase their social capital, a motivating factor for Internet use.

The results provide strong support for the diversification hypothesis, suggesting that members of disadvantaged groups who have access to the Internet use it to overcome existing social inequalities that otherwise limit their access to health information. They also use the technology to participate in online discussions about health issues. However, contrary to our hypotheses, the differences among the groups were based on ethnic lines, not migration status. We maintain that these differences result from the varying patterns of residency among ethnic minorities and immigrants.

The former are more likely to live in remote, non-metropolitan areas with less access to specialized health information. In contrast, immigrant groups, mainly those from the former Soviet Union, generally settle in urban areas with easy access to health information.

Finally, our study contributes to the topic of health behavior in three ways. First, we show that access to health information and health related online communication has implications for health behaviors. Previous studies on access to health information and communication focused on the factors affecting access, neglecting the potential implications of the information found for improving the quality of the searcher's life. Individuals who searched for health information and were involved in online communication about health issues were more likely to change their health behavior. This finding contributes to the literature on the social effects of exposure to media. It is a particularly significant finding because it held for the entire population, regardless of ethnicity or migration status.

We were also able to show that there is a positive association between satisfaction with one's physician and the search for health information and the use of online communication. While some have argued that greater access to medical information may lead to conflicts between the patient and the physician, our findings seem to indicate a more complementary role. It is reasonable to assume that a patient who comes to a doctor armed with information gleaned online can have a more focused discussion on health matters with the physician. At the same time, the finding also suggests that physicians should not hesitate to encourage patients to become more informed themselves through online information and communication. While the direction of the effects cannot be explored in our cross sectional design, our results do

imply that there is a collaborative relationship between the patient, the physician and the Internet.

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Table 1. *OLS regression predicting Internet use for searching for health information and communicating about health issues*

Variable	<i>Internet use for health communications</i>			<i>Internet use for searching for health information</i>		
	B	S.E.	$\beta$	B	S.E.	$\beta$
Age	-.01	.01	-.06	-.05	.01	-.19**
Marital status (1=married)	.08	.11	.03	.44	.35	.04
Number of Children	-.01	.03	-.02	-.09	.10	-.03
Gender (1=male)	-.05	.09	-.02	-.88	.27	-.09**
Education						
High School	.06	.14	.02	-.58	.44	-.05
College	-.05	.11	.01	-.77	.36	-.08*
Graduate School	.04	.11	.01	-.84	.36	-.08*
Income	.04	.03	.06	.08	.12	.04
Immigrants	-.46	.16	-.13**	-2.13	.51	-.16**
Israeli Jews	-.49	.12	-.18**	-2.43	.37	-.24**
Frequency of Internet use	-.01	.02	-.02	.10	.06	.04
Medical condition						
Hypertension	.06	.11	.02	.74	.35	.06*
Diabetes	.09	.17	.01	-.30	.55	-.01
Heart disease	.06	.15	.01	1.23	.49	.07**
Cancer	.21	.19	.03	-.51	.62	-.02
Patient satisfaction with physician	.01	.006	.10**	.05	.01	.08**
Constant	3.15	.27**		14.06	.83**	

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Adjusted R Square	.04	.14
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Table 2. OLS predicting change in health habits

	<i>Communicating about Health Issues</i>			<i>Searching for Health Information</i>		
	B	S.E.	$\beta$	B	S.E.	$\beta$
Age	-.01	.007	-.06	.01	.01	.03
Marital status (1=married)	.12	.22	.01	-.05	.22	-.01
Gender (1=male)	-.10	.17	-.01	.18	.17	.02
<i>Education</i>						
High School	-.06	.28	-.09	.10	.28	.01
College	-.12	.23	-.01	.13	.23	.02
Graduate School	-.26	.23	-.03	-.01	.23	-.02
<i>Income</i>						
Immigrants	-1.13	.32	-.11**	-.32	.32	-.03
Israeli Jews	-1.20	.23	-.17**	-.30	.24	-.04
Frequency of Internet use	.03	.04	.02	-.02	.04	-.01
Hypertension	.14	.22	.01	-.11	.22	-.01
Diabetes	.45	.35	.03	.53	.35	.04
Heart disease	.42	.31	.03	.01	.31	.01
Cancer	.35	.39	.02	.47	.39	.03
Satisfaction with physician	.04	.01	.09**	.02	.01	.05*
Seeking health information online				.57	.07	.21**
Participating in online communications about health issues				.26	.07	.09**

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Constant	5.52	.52**	
<i>Adj. R Square</i>	.12		.22

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\*\* $p < .01$  \* $p < .05$