Published in final edited form as:

Addict Behav. 2011 July ; 36(7): 769–772. doi:10.1016/j.addbeh.2011.02.007.

BLACK AND WHITE ADULTS' PERSPECTIVES ON THE GENETICS OF NICOTINE ADDICTION SUSCEPTIBILITY

Elyse R. Park, Ph.D., MPH^{a,b,c}, Susan Kleimann, Ph.D.^d, Emily J. Youatt^a, Abigail Lockhart^a, Eric G. Campbell, Ph.D.^b, Douglas E. Levy, Ph.D.^{a,b}, Chanita Hughes Halbert, Ph.D.^e, Erin Schmieder, MSc^d, Rasika Krishna, BA^d, and Alexandra E. Shields, Ph.D.^{a,b}

^aHarvard/MGH Center on Genomics, Vulnerable Populations, and Health Disparities, 50 Staniford St., Suite 901, Boston, MA 02114

^bMongan Institute for Health Policy, Harvard Medical School, 50 Staniford St., Suite 901, Boston, MA 02114

^cDepartment of Psychiatry, Massachusetts General Hospital, 55 Fruit St. Boston, MA 02114

^dKleimann Communication Group, 1321 Rhode Island Ave. NW Washington, D.C. 20005

^eUniversity of Pennsylvania, Department of Psychiatry and Abramson Cancer Center, 3535 Market St. Suite 4100, Philadelphia, PA 19104

Abstract

Aims—Emerging research may soon lead to improved quit rates via genetically-tailored smoking cessation treatment. The purpose of this study was to explore individuals' beliefs and attitudes about genetic testing in this context, and how these may differ across racial groups.

Design—Two site qualitative study.

Methods—Eleven focus groups were conducted in 2007 with 51 Black and 55 White adult participants in Montgomery, AL and Baltimore, MD.

Measurements—Questions were asked about smoking as an addiction, the role of genetics in nicotine addiction susceptibility, and undergoing genetic testing to receive tailored smoking cessation treatment. Data were analyzed using content analysis.

© 2010 Elsevier Ltd. All rights reserved.

Address correspondence and reprint requests to: Elyse R. Park, Ph.D., MPH, Institute for Health Policy, 50 Staniford St., Suite 901, Boston, MA 02114, Tel 617.724.6836, Fax 617.724.4738, epark@partners.org.

Contributors

Authors Alexandra E. Shields, Ph.D., Eric G. Campbell, Ph.D., Douglas E. Levy, Ph.D., and Elyse R. Park, Ph.D., MPH designed the study and wrote the interview guide. Chanita Hughes Halbert, Ph.D. contributed to the interview guide. Emily J. Youatt and Abigail Lockhart conducted literature searches and provided summaries of previous research studies. Susan Kleimann, Ph.D., Elyse R. Park, Ph.D., MPH, Chanita Hughes Halbert, Ph.D. and Alexandra E. Shields, Ph.D. facilitated the data collection. Emily J. Youatt, Rasika Krishna, BA, and Erin Schmieder conducted the data coding. Elyse R. Park, Ph.D., MPH and Susan Kleimann, Ph.D. oversaw the coding. Elyse R. Park, Ph.D., MPH wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Findings—Most participants believed that smoking was an addiction yet were unwilling to endorse the notion that genetics played a role in nicotine addiction susceptibility. However, 91% of White participants and 62% of Black participants indicated that they would likely take a genetic test that would match them to their optimal smoking cessation treatment. The primary potential benefit was a vague sense that additional knowledge about oneself would be of value. Primary barriers included disinterest and skepticism about the test, unwillingness to believe that genetics played a role in nicotine addiction or treatment response, and concerns about psychological consequences.

Conclusions—The majority of participants, particularly Black participants, did not believe that genetics played a significant role in nicotine addiction susceptibility but were willing to undergo genetic testing. Participants identified some benefit to tailoring smoking treatment by genotype. However, participants also expressed skepticism about the test and concerns about its consequences; these issues would need to be addressed in the clinical encounter.

Keywords

racial differences; genetic testing; nicotine addiction; addiction susceptibility; smoking cessation

1. INTRODUCTION

Tobacco use remains the leading cause of preventable death in the United States (1), and vast disparities persist in smoking-related morbidity across low-educated and minority communities (2–4). African Americans have the highest incidence and mortality rates of smoking-related lung cancer (5–7) and are less likely to receive and use behavioral and pharmacological cessation interventions (8, 9) and succeed in quitting (2, 7, 10–17).

Research demonstrates the role of genetic factors in nicotine addiction (18–31) and how genetic variants in drug metabolism and drug targets influence individuals' responses to cessation treatments (32–35). Recent research has suggested that patients with specific genotypes do better on the nicotine patch versus the nasal spray (36) and that receiving individually-tailored treatment substantially improved quit rates (36–38).

This research may soon lead to genetically tailored smoking cessation treatment (26, 39). However, no study has assessed patients' perspectives. In particular, barriers for individuals with low education and minority smokers need to be explored. Smokers with less education have been found to have less interest in genetic testing (40–43). One recent study suggested that Blacks believe that biological factors play a limited role in smoking cessation (44). This study explored Black and White individuals' attitudes and beliefs about the role of genetics in addiction and how these factors affected their perceived value of genetic testing to tailor smoking cessation treatment.

2. METHODS

Eleven focus groups of 106 self-identified Black and White adults, stratified by race and smoking status, were conducted in Baltimore, Maryland and Montgomery, Alabama in 2007.

2.1. Recruitment and Participants

Participants were recruited by two professional focus group research centers. Black and White individuals were deemed eligible if they were at least 18 years old, had less than 4-years of college education, and had no personal history of lung cancer. Participants completed a demographic questionnaire, a consent form, and received \$50 in remuneration.

Each group lasted two hours and was co-facilitated by study investigators. Study procedures were approved by the Institutional review board of MGH/Partners HealthCare.

2.2. Data Collection and Design

Facilitators used a semi-structured interview guide. Initially, facilitators asked broadly whether smoking was an addiction (“not being able to stop smoking even if you want to”). Questions addressed participants’ beliefs about addiction in general, the role of genetics in addiction in general, and the role and genetics in addiction to nicotine. Participants were given a hypothetical scenario about a patient whose physician offers a genetic test that would match the smoker to the best smoking cessation treatment. Participants were asked to rate the likelihood (1=“Very Unlikely” to 5=“Very Likely”) that they would take the test and give their reasons why they would and would not want the test. Specific probes queried for discrimination concerns as a barrier.

2.3. Data Analysis

All focus groups were audiotaped and transcribed. The moderator later reviewed the transcripts for accuracy. Three members of the research team coded data independently using Atlas.ti, version 5.0; data were analyzed using content analysis to identify major concepts and axial coding to group and connect data (45, 46). At each analysis phase, the three coders compared their results to confirm intercoder reliability, resolving discrepancies through discussion and comparison of the raw data. Themes within each content area were identified, and responses were categorized into codes. The coders then refined their definitions and the content of the codes and compared their coding lists. Analyses were conducted by smoking status and by race.

3. RESULTS

A total of 106 individuals participated in 11 focus groups (Table 1).

3.1. Beliefs about Addiction

The majority of participants believed that smoking was a powerful addiction. Almost all participants believed that addiction acted like a disease that was genetic and thus inherited.

A repeated theme was that an addiction could be passed down through families but could skip generations. One Black nonsmoker expressed a common belief: *“Like any other disease, [addiction] may be passed to one child but not the other child. It may skip two generations... and then decimate another generation.”*

Many smokers and nonsmokers described how an addiction, although not necessarily the same type of addiction, was passed down through generations. One White smoker explained, *“Even though it may not be smoking or drugs or anything, it could be overeating...it’s an addiction to something [that’s inherited].”* Smoking was often named as one of the many addictions that could run in one’s family, described as *“already mapped”* and *“in one’s bloodline.”*

3.2. Beliefs about Smoking/Nicotine Addiction as Genetic

Participants’ beliefs about the relationship between smoking and genetics were varied. Although many participants believed that addiction was a disease, and acknowledged that diseases have genetic components, many, particularly Black participants were unwilling to endorse the notion that genetics play a role in nicotine addiction. As one Black smoker summarized, *“Smoking is not a disease. Diseases are genetic and stuff that people inherit, not smoking.”*

Most individuals' beliefs about the influence of genetics on smoking behavior were based primarily on their own family histories, and there were no discernable differences by race. One White smoker explained, "...*It runs in my family. My daddy smoked... on his side they smoked.*" Taking the contrary view, a Black smoker explained, "*I am the only one in my family that does smoke besides my father, so I know genetics didn't play a part in it.*"

Black and White participants alike often used examples of pregnancy and in utero transmission of dependence to support or refute the connection between genetics and nicotine addiction susceptibility. A commonly articulated belief was that a child would "inherit" an addiction to substances used during pregnancy. One Black smoker explained, "*I think genetically applies with cocaine and heroin because if a baby is born from a mother that is addicted on one of those drugs... they have to give the baby smaller doses of heroin or cocaine to calm the baby down. I know they don't have to do that with tobacco...*"

The ability to quit smoking was often described as primarily a matter of willpower, not genetics. One Black nonsmoker said, "*I think [smoking] is not a genetic thing... I think it's something a person chooses to do... not genetic.*" Others felt that focusing on the role of genetics in nicotine addiction susceptibility might be used to abdicate personal responsibility for one's behavior. One Black smoker described, "*I think sometimes a person might want to use genetics just as an excuse, but it is all about the choice you make. You can't blame it on the genes... or what your other family members did.*"

3.3. Reasons in Support of Having a Genetic Test to Receive Tailored Smoking Cessation Treatment

Surprisingly, 77% of participants (91% of Whites and 62% of Blacks) said that they would be willing to undergo the genetic testing (responding with a 4 or 5).

3.3.1. Gaining additional information about themselves—The most common reason for taking the test, cited by Black and White participants alike, was to gain more information about oneself. Participants' explanations about why they would be willing to take the test typically conveyed a sense of 'why not.' As one Black smoker remarked, "*The more information you get, the better off you are.*" Another White smoker shrugged, "*What is it going to hurt to know?*"

3.3.2. Encouraging quitting—Many individuals, particularly Whites, felt that smokers would gain hope and encouragement to know that there was an option of tailored treatment to help them if and when they wanted to quit. One White nonsmoker said, "*I think when they are ready to [quit]... it's good to know that there's a way.*"

3.3.3. Helping Others—Many participants, particularly smokers, would be motivated to take the test, considering the possibility that it could be helpful for their children. One Black smoker said, "*If I could do [the test] for my child and prove that this is how it may be... I would.*"

3.3.4. Contributing to scientific gains linking genetics and nicotine addiction—Some participants offered to take the test to help prove the connection between genes and addiction and thus contribute to science by aiding future research. One White smoker said, "*[The test] proves that it is in your genes. Hopefully... we can pinpoint that gene and do something about it. That way I don't pass it on to my kids and their kids...*"

3.4. Reasons against Having a Genetic Test to Receive Tailored Smoking Cessation Treatment

3.4.1. Disinterest in taking the test—Some participants, primarily nonsmokers, said that individuals who did not want to quit smoking would find the test irrelevant. One White nonsmoker explained, *“It’s like having your head in the sand, nothing is wrong if I don’t know about it.”* A deterrent for some Black participants was a concern about side effects of the smoking cessation medication. As one Black smoker stated, *“I don’t like to take any kind of medication unless I’m dying.”*

3.4.2. Skepticism about value and validity of the test—Many participants, primarily Blacks, simply rejection the notion that addiction to nicotine has a genetic component. Participants who did not believe in the gene-nicotine addiction susceptibility connection felt no inclination to take the test. One Black smoker insisted, *“I don’t think [smoking] is genetic, [so] it would be a waste of my time.”* Furthermore, some individuals questioned the value of a simple test. One Black smoker stated *“...I don’t believe all brains are chemically made up the same way, so how can he say he has an approved genetic test for you and me and him, him and him?”*

3.4.3. Concerns about Psychological Sequelae of Genetic Testing—Black and White participants were concerned that test results could have emotional implications. Participants worried that these individuals who tested positive would feel discouraged and hopeless. One White smoker admitted, *“I don’t even want them telling me it’s going to be harder to stop.”* There was also concern that some patients might become fatalistic. A Black nonsmoker explained, *“The doctor said I got the gene in me. I can’t do nothing about it...”*

4. DISCUSSION

Our study emphasizes the salience of underlying beliefs regarding addiction and heritability that are likely to affect smokers’ willingness to undergo genetic testing. Many participants doubted that some individuals would even undergo testing because they did not believe that smoking was an addiction or genetically influenced. If participants could move past these doubts, skepticism about the test’s efficacy and concerns about the test results still existed. Similar to a prior research with physicians (47), participants voiced concerns about the emotional effects of test results.

Similar to previous research we found few attitudinal differences between smokers and nonsmokers (44). Black and White participants shared many beliefs and attitudes about smoking as an addiction and addiction as a disease that could be inherited. However, Black participants were less likely than White participants to endorse the influence of genetics on smoking and were more skeptical of the value of the test. It is possible that Black participants’ higher level of skepticism about taking the test and taking medication belied their mistrust; Blacks are less likely to undergo genetic testing due to mistrust in the medical system as a whole (43). However, unlike previous findings of physicians’ concerns about genetically-tailored smoking cessation treatment and insurance discrimination (47), surprisingly few participants endorsed this concern.

Despite barriers cited, almost all of White participants and two-thirds of Black participants indicated that they would likely take a genetic test that would match them to their optimal smoking cessation treatment. Previous research showed that similar rates of Blacks would be willing to participate in research regarding genetic risk factors of smoking (48).

Some study limitations must be noted. Since the group of nonsmokers contained individuals who were former smokers, some differences in smoking status could have been masked.

Participants who were not currently smoking were asked to respond in a hypothetical manner, although vignettes are a commonly used to explore participants' attitudes (49). As this is a qualitative pursuit, our findings are not representative of Blacks and Whites in the United States.

Acknowledgments

Role of Funding Sources

Funding for this study was provided by the National Institutes of Health [R01 HG003475-01A1 to A.E.S.] and the American Cancer Society Mentored Research Scholar Grant [E.R.P]. The National Institutes of Health and the American Cancer Society had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

This work was supported by the National Institutes of Health [R01 HG003475-01A1 to A.E.S.] and the American Cancer Society Mentored Research Scholar Grant [E.R.P]. We would like to thank Jennifer Pandiscio, Anna Boonin Schachter, and Hannah Pajolek for their assistance in preparing this manuscript.

References

1. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. *JAMA*. 2004 Mar 10; 291(10):1238–45. [PubMed: 15010446]
2. Fagan P, Moolchan ET, Lawrence D, Fernander A, Ponder PK. Identifying health disparities across the tobacco continuum. *Addiction*. 2007 Oct; 102(Suppl 2):5–29. [PubMed: 17850611]
3. Singh, GK.; Miller, BA.; Hankey, BF.; Edwards, BK. Area Socioeconomic Variations in U.S. Cancer Incidence, Mortality, Stage, Treatment, and Survival, 1975–1999. Bethesda, MD: National Cancer Institute; 2003.
4. Steenland K, Henley J, Thun M. All-cause and cause-specific death rates by educational status for two million people in two American Cancer Society cohorts, 1959–1996. *Am J Epidemiol*. 2002 Jul 1; 156(1):11–21. [PubMed: 12076884]
5. Flenaugh EL, Henriques-Forsythe MN. Lung cancer disparities in African Americans: Health versus health care. *Clin Chest Med*. 2006 Sep; 27(3):431, 9, vi. [PubMed: 16880053]
6. Gadgeel SM, Severson RK, Kau Y, Graff J, Weiss LK, Kalemkerian GP. Impact of race in lung cancer: Analysis of temporal trends from a surveillance, epidemiology, and end results database. *Chest*. 2001 Jul; 120(1):55–63. [PubMed: 11451816]
7. Haiman CA, Stram DO, Wilkens LR, Pike MC, Kolonel LN, Henderson BE, Le Marchand L. Ethnic and racial differences in the smoking-related risk of lung cancer. *N Engl J Med*. 2006 Jan 26; 354(4):333–42. [PubMed: 16436765]
8. Cokkinides VE, Halpern MT, Barbeau EM, Ward E, Thun MJ. Racial and ethnic disparities in smoking-cessation interventions: Analysis of the 2005 National Health Interview survey. *Am J Prev Med*. 2008 May; 34(5):404–12. [PubMed: 18407007]
9. Fu SS, Burgess D, van Ryn M, Hatsukami DK, Solomon J, Joseph AM. Views on smoking cessation methods in ethnic minority communities: A qualitative investigation. *Prev Med*. 2007 Mar; 44(3):235–40. [PubMed: 17175016]
10. Covey LS, Botello-Harbaum M, Glassman AH, Masmela J, LoDuca C, Salzman V, Fried J. Smokers' response to combination bupropion, nicotine patch, and counseling treatment by race/ethnicity. *Ethn Dis*. 2008 Winter; 18(1):59–64. [PubMed: 18447101]
11. Cropsey KL, Weaver MF, Eldridge GD, Villalobos GC, Best AM, Stitzer ML. Differential success rates in racial groups: Results of a clinical trial of smoking cessation among female prisoners. *Nicotine Tob Res*. 2009 Jun; 11(6):690–7. [PubMed: 19386816]
12. Fu SS, Kodl MM, Joseph AM, Hatsukami DK, Johnson EO, Breslau N, Wu B, Bierut L. Racial/Ethnic disparities in the use of nicotine replacement therapy and quit ratios in lifetime smokers ages 25 to 44 years. *Cancer Epidemiol Biomarkers Prev*. 2008 Jul; 17(7):1640–7. [PubMed: 18583471]

13. Gandhi KK, Foulds J, Steinberg MB, Lu SE, Williams JM. Lower quit rates among African American and Latino menthol cigarette smokers at a tobacco treatment clinic. *Int J Clin Pract*. 2009 Mar; 63(3):360–7. [PubMed: 19222622]
14. Centers for Disease Control and Prevention. Cigarette smoking among adults- United States 2000. *MMWR Weekly*. 2002; 51(29):642–5.
15. Fiore MC. Trends in cigarette smoking in the United States: The epidemiology of tobacco use. *The Medical Clinics of North America*. 1992; 76(2):289–303. [PubMed: 1548962]
16. Fiore MC, Novotny TE, Pierce JP, Hatziandreu EJ, Patel KM, Davis RM. Trends in cigarette smoking in the United States: The changing influence of gender and race. *JAMA*. 1989; 261(1): 49–55. [PubMed: 2908994]
17. Giovino GA, Schooley MW, Zhu BP, Chrismon JH, Tomar SL, Peddicord JP, Merritt RK, Husten CG, Eriksen MP. Surveillance for selected tobacco-use behaviors--United States, 1900–1994. *MMWR CDC Surveill Summ* [Internet]. 1994 Nov 18; 43(3):1–43.
18. Audrain-McGovern J, Al Koudsi N, Rodriguez D, Wileyto EP, Shields PG, Tyndale RF. The role of CYP2A6 in the emergence of nicotine dependence in adolescents. *Pediatrics*. 2007 Jan; 119(1): 264–74.
19. Batra V, Patkar AA, Berrettini WH, Weinstein SP, Leone FT. The genetic determinants of smoking. *Chest*. 2003 May; 123(5):1730–9. [PubMed: 12740294]
20. Hung RJ, McKay JD, Gaborieau V, Boffetta P, Hashibe M, Zaridze D, Mukeria A, Szeszenia-Dabrowska N, Lissowska J, Rudnai P, Fabianova E, Mates D, Bencko V, Foretova L, Janout V, Chen C, Goodman G, Field JK, Liloglou T, Xinarianos G, Cassidy A, McLaughlin J, Liu G, Narod S, Krokan HE, Skorpén F, Elvestad MB, Hveem K, Vatten L, Linseisen J, Clavel-Chapelon F, Vineis P, Bueno-de-Mesquita HB, Lund E, Martínez C, Bingham S, Rasmussen T, Hainaut P, Riboli E, Ahrens W, Benhamou S, Lagiou P, Trichopoulos D, Holcatova I, Merletti F, Kjaerheim K, Agudo A, Macfarlane G, Talamini R, Simonato L, Lowry R, Conway DI, Znaor A, Healy C, Zelenika D, Boland A, Delepine M, Foglio M, Lechner D, Matsuda F, Blanche H, Gut I, Heath S, Lathrop M, Brennan P. A susceptibility locus for lung cancer maps to nicotinic acetylcholine receptor subunit genes on 15q25. *Nature*. 2008 Apr 3; 452(7187):633–7. [PubMed: 18385738]
21. Karp I, O'Loughlin J, Hanley J, Tyndale RF, Paradis G. Risk factors for tobacco dependence in adolescent smokers. *Tob Control*. 2006 Jun; 15(3):199–204. [PubMed: 16728750]
22. Lerman C, Berrettini W. Elucidating the role of genetic factors in smoking behavior and nicotine dependence. *Am J Med Genet B Neuropsychiatr Genet*. 2003 Apr 1; 118B(1):48–54. [PubMed: 12627466]
23. Lerman C, Caporaso NE, Audrain J, Main D, Bowman ED, Lockshin B, Boyd NR, Shields PG. Evidence suggesting the role of specific genetic factors in cigarette smoking. *Health Psychol*. 1999 Jan; 18(1):14–20. [PubMed: 9925041]
24. Lerman C, Caporaso NE, Audrain J, Main D, Boyd NR, Shields PG. Interacting effects of the serotonin transporter gene and neuroticism in smoking practices and nicotine dependence. *Mol Psychiatry*. 2000 Mar; 5(2):189–92. [PubMed: 10822347]
25. Lerman C, Caporaso NE, Bush A, Zheng YL, Audrain J, Main D, Shields PG. Tryptophan hydroxylase gene variant and smoking behavior. *Am J Med Genet*. 2001 Aug 8; 105(6):518–20. [PubMed: 11496367]
26. Lerman C, Niaura R. Applying genetic approaches to the treatment of nicotine dependence. *Oncogene*. 2002 Oct 21; 21(48):7412–20. [PubMed: 12379882]
27. Lerman C, Shields PG, Audrain J, Main D, Cobb B, Boyd NR, Caporaso N. The role of the serotonin transporter gene in cigarette smoking. *Cancer Epidemiol Biomarkers Prev*. 1998 Mar; 7(3):253–5. [PubMed: 9521442]
28. Munafo M, Johnstone E, Murphy M, Walton R. New directions in the genetic mechanisms underlying nicotine addiction. *Addict Biol*. 2001 Apr; 6(2):109–17. [PubMed: 11341850]
29. Sullivan PF, Jiang Y, Neale MC, Kendler KS, Straub RE. Association of the tryptophan hydroxylase gene with smoking initiation but not progression to nicotine dependence. *Am J Med Genet*. 2001 Jul 8; 105(5):479–84. [PubMed: 11449402]
30. Thorgeirsson TE, Geller F, Sulem P, Rafnar T, Wiste A, Magnusson KP, Manolescu A, Thorleifsson G, Stefansson H, Ingason A, Stacey SN, Bergthorsson JT, Thorlacius S,

- Gudmundsson J, Jonsson T, Jakobsdottir M, Saemundsdottir J, Olafsdottir O, Gudmundsson LJ, Bjornsdottir G, Kristjansson K, Skuladottir H, Isaksson HJ, Gudbjartsson T, Jones GT, Mueller T, Gottsater A, Flex A, Aben KK, de Vegt F, Mulders PF, Isla D, Vidal MJ, Asin L, Saez B, Murillo L, Blondal T, Kolbeinsson H, Stefansson JG, Hansdottir I, Runarsdottir V, Pola R, Lindblad B, van Rij AM, Dieplinger B, Haltmayer M, Mayordomo JI, Kiemeny LA, Matthiasson SE, Oskarsson H, Tyrfingsson T, Gudbjartsson DF, Gulcher JR, Jonsson S, Thorsteinsdottir U, Kong A, Stefansson K. A variant associated with nicotine dependence, lung cancer and peripheral arterial disease. *Nature*. 2008 Apr 3; 452(7187):638–42. [PubMed: 18385739]
31. Yoshimasu K, Kiyohara C. Genetic influences on smoking behavior and nicotine dependence: A review. *J Epidemiol*. 2003 Jul; 13(4):183–92. [PubMed: 12934961]
 32. Berrettini WH, Wileyto EP, Epstein L, Restine S, Hawk L, Shields P, Niaura R, Lerman C. Catechol-O-methyltransferase (COMT) gene variants predict response to bupropion therapy for tobacco dependence. *Biol Psychiatry*. 2007 Jan 1; 61(1):111–8. [PubMed: 16876132]
 33. Cinciripini P, Wetter D, Tomlinson G, Tsoh J, De Moor C, Cinciripini L, Minna J. The effects of the DRD2 polymorphism on smoking cessation and negative affect: Evidence for a pharmacogenetic effect on mood. *Nicotine Tob Res*. 2004 Apr; 6(2):229–39. [PubMed: 15203796]
 34. Dahl JP, Jepsen C, Levenson R, Wileyto EP, Patterson F, Berrettini WH, Lerman C. Interaction between variation in the D2 dopamine receptor (DRD2) and the neuronal calcium sensor-1 (FREQ) genes in predicting response to nicotine replacement therapy for tobacco dependence. *Pharmacogenomics J*. 2006 May-Jun; 6(3):194–9. [PubMed: 16402081]
 35. Lerman C, Jepsen C, Wileyto EP, Epstein LH, Rukstalis M, Patterson F, Kaufmann V, Restine S, Hawk L, Niaura R, Berrettini W. Role of functional genetic variation in the dopamine D2 receptor (DRD2) in response to bupropion and nicotine replacement therapy for tobacco dependence: Results of two randomized clinical trials. *Neuropsychopharmacology*. 2006 Jan; 31(1):231–42. [PubMed: 16123753]
 36. Lerman C, Wileyto EP, Patterson F, Rukstalis M, Audrain-McGovern J, Restine S, Shields PG, Kaufmann V, Redden D, Benowitz N, Berrettini WH. The functional mu opioid receptor (OPRM1) Asn40Asp variant predicts short-term response to nicotine replacement therapy in a clinical trial. *Pharmacogenomics J*. 2004; 4(3):184–92. [PubMed: 15007373]
 37. Munafo MR, Shields AE, Berrettini WH, Patterson F, Lerman C. Pharmacogenetics and nicotine addiction treatment. *Pharmacogenomics*. 2005 Apr; 6(3):211–23. [PubMed: 16013953]
 38. Uhl GR, Liu QR, Drgon T, Johnson C, Walther D, Rose JE, David SP, Niaura R, Lerman C. Molecular genetics of successful smoking cessation: Convergent genome-wide association study results. *Arch Gen Psychiatry*. 2008 Jun; 65(6):683–93. [PubMed: 18519826]
 39. Schnoll RA, Lerman C. Current and emerging pharmacotherapies for treating tobacco dependence. *Expert Opin Emerg Drugs*. 2006 Sep; 11(3):429–44. [PubMed: 16939383]
 40. Andrykowski MA, Munn RK, Studts JL. Interest in learning of personal genetic risk for cancer: A general population survey. *Prev Med*. 1996 Sep-Oct; 25(5):527–36. [PubMed: 8888320]
 41. Lerman C, Hughes C, Trock BJ, Myers RE, Main D, Bonney A, Abbaszadegan MR, Harty AE, Franklin BA, Lynch JF, Lynch HT. Genetic testing in families with hereditary nonpolyposis colon cancer. *JAMA*. 1999 May 5; 281(17):1618–22. [PubMed: 10235155]
 42. Mogilner A, Otten M, Cunningham JD, Brower ST. Awareness and attitudes concerning BRCA gene testing. *Ann Surg Oncol*. 1998 Oct-Nov; 5(7):607–12. [PubMed: 9831109]
 43. Peters N, Rose A, Armstrong K. The association between race and attitudes about predictive genetic testing. *Cancer Epidemiol Biomarkers Prev*. 2004 Mar; 13(3):361–5. [PubMed: 15006909]
 44. Halbert CH, Gandy OH Jr, Collier A, Shaker L. Beliefs about tobacco use in African Americans. *Ethn Dis*. 2007 Winter; 17(1):92–8. [PubMed: 17274216]
 45. Patton, MQ. *Qualitative Evaluation and Research Methods*. 2. Newbury Park, CA: Sage Publications, Inc; 1990.
 46. Strauss, A.; Corbin, J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, CA: Sage Publications, Inc; 1990.
 47. Park ER, Kleimann S, Pelan JA, Shields AE. Anticipating clinical integration of genetically tailored tobacco dependence treatment: Perspectives of primary care physicians. *Nicotine Tob Res*. 2007 Feb; 9(2):271–9. [PubMed: 17365758]

48. Halbert CH, Gandy OH Jr, Collier A, Shaker L. Intentions to participate in genetics research among African American smokers. *Cancer Epidemiol Biomarkers Prev.* 2006 Jan; 15(1):150–3. [PubMed: 16434602]
49. Finch J. The vignette technique in survey research. *Sociology.* 1987; 21:105–14.

Research Highlights

- Many participants were doubtful that genetics played a role in nicotine addiction
- Black participants, in particular, did not believe in the role of genetics
- Most participants would take a genetic test to determine optimal tobacco treatment
- Black participants were less willing than White participants to take the test
- Skepticism about the test and concerns about its consequences were test barriers

Table 1

Characteristics of Study Participants (N=106) Baltimore, MD & Montgomery, AL, 2007

Characteristics	
Mean Age (range: 19–82) (years)	45
Female (%)	51
Black (%)	48
Educational Level (%)	
Less than High School	14
Completed High School	25
Post high school	61
Annual Household Income (%)	
Less than \$10,000	11
\$10,000 to less than \$30,000	22
\$30,000 to less than \$50,000	23
\$50,000 to less than \$100,000	30
\$100,000 or more	10
Don't Know/Refused	4