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Associations between Modifiable Health-Risk Behaviors and Personality Types

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Abstract

Objectives: The first objective for this study was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with the following modifiable health-risk behaviors: smoking, exercise, alcohol consumption, nutrition, sleep, depression-related stress, anxiety-related stress, healthcare professional usage, and self-discipline. The second objective for this study was to explore if characteristics of personality type are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information.

Methods: Data were collected from 10,500 adult individuals residing in the United States via an on-line, self-administered survey coordinated by Qualtrics Panels from March 14-30, 2016. Chi-square analysis was used for making comparisons between categories of personality types and items related to health-risk behaviors. Statistical significance was set at $p < 0.05$. However, chi-square analysis with large sample sizes (e.g. 10,500 in this study) readily yields statistical significance. Practical significance was set at four or more percentage points above or below the overall mean.

Results: Regarding objective 1, personality type was associated with all nine health-risk behaviors studied. Personality types within the Experiencer temperament (17% of the U.S. population) accounted for 46% of the undesirable scores we computed for health-risk behaviors. The Idealist temperament (17% of population) accounted for 32% of the undesirable scores. Conceptualizers (10% of population) accounted for 17% of the undesirable scores and Traditionalists (46% of population) accounted for 5% of the undesirable scores. Regarding objective 2, the findings showed that personality type was associated with (1) the importance people place on the patient-physician relationship, (2) which characteristics of that relationship are most desirable, (3) desire for more communication with their physician, and (4) the preferred method for receiving information.

Discussion and Conclusions: Precision medicine has been proposed as a way to create a new taxonomy of disease that uses individual specific data to develop accurate diagnosis, targeted treatment, and improved health outcomes. Based on the findings of this study, we propose that inclusion of personality type is an important component of these efforts so that the health care system can conform more to the individual patient in order to increase engagement and adherence, reduce errors, minimize ineffective treatment and waste, and can be cost effective.

Modifiable health-risk behaviors are unhealthy actions individuals can change [1]. Goetzel and colleagues [2] reported that ten modifiable health-risk behaviors were linked to more than one-fifth of employer-employee health care spending. There are estimates that eliminating three health-risk behaviors – poor diet, inactivity, and smoking – would prevent 80% of heart disease and stroke, 80% of type 2 diabetes, and 40% of cancer [3]. The proportion of the U.S. adult population that engages in unhealthy behaviors is relatively large [1] and achieving long-term behavior change and health-risk reduction is difficult [2]. There is great motivation on the part of healthcare stakeholders to find effective ways to alleviate this problem [4-6].

In a previous study, using responses from 10,500 adults residing in the United States [7], we found that personality type characteristics (using the Preferred Communication Style Questionnaire) can be used to develop and implement

successful change strategies and intervention tools, such as individualized wellness plans (IWP™) that help promote healthy behaviors for reducing chronic disease [7]. The assumption guiding that study was that individuals are more likely to experience success in changing health-risk behaviors if they engage in activities that are consistent with (i) how they are energized, (ii) the kind of information they naturally notice, (iii) how they prefer to make decisions, and (iv) their preferences to live in a more structured way or in a more spontaneous way [7-12].

As a follow-up to that study, we wanted to explore if personality type might be associated with the very health-risk behaviors that were targeted for modification through healthy behavior promotion. Therefore, the **first objective for this study** was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with the following modifiable health-risk behaviors: smoking, exercise, alcohol consumption, nutrition, sleep, depression-related stress, anxiety-related stress, healthcare professional usage, and self-discipline [1-7]. This would help identify if personality type is associated with the likelihood of presenting with health-risk behaviors in the first place.

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As another follow-up to the first study [7], we wanted to investigate if personality type might also be associated with how patients desire to interact with their physician. Specifically, the **second objective for this study** was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information. The second objective would help gain an understanding regarding how personality types are associated with how best to communicate specific strategies that would be employed to change health-risk behaviors.

Methods

The methods applied in this report are the same as those that were used in a related study that developed Individualized Wellness Plans (IWPs) for reducing chronic disease [7]. For completeness, the methods are repeated in this article.

Study Variables

Tieger and colleagues developed and validated the **Preferred Communication Style Questionnaire** as a way to measure the specific characteristics of a persons’ personality type [11, 12]. Questions in that questionnaire are forced-choice. Respondents are asked to choose which answer – A or B – describes them better as a whole (See **Appendix A**). Each question identified the same personality characteristics that are identified by the Myers-Briggs Type Indicator (MBTI®) [9] as summarized in **Table 1**.

Table 1: Preferred Communication Style Questionnaire*

Question in the Survey	Response Option	Link to MBTI®
Question 1: Would you rather talk with lots of different people, or have an in-depth conversation with one person? (ways to focus one’s energy)	A: You get excited and energized by being around people. B: While you like people, you also enjoy spending quiet time by yourself.	(E) Extraversion (I) Introversion
Question 2: Are you more of a realistic person who pays attention to what is happening now? Or a person who thinks about what may happen in the future? (ways to take in information)	A: You’d rather talk about real things than ideas that don’t have much practical value. B: You enjoy thinking about new ideas and possibilities.	(S) Sensing (N) iNtuition
Question 3: Do you tend to make decisions based more on logic or on your personal feelings? (ways to make decisions)	A: You are most convinced by logical arguments. B: When making a decision, you consider how people will feel about it.	(T) Thinking (F) Feeling
Question 4: Do you prefer to live in a more planful, organized way? Or a more open-minded, spontaneous way? (ways to organize one’s world)	A: You like things decided and feel best when you’ve got a plan. B: You like to keep your options open before making some decisions.	(J) Judging (P) Perceiving

* These questions identify the same personality type characteristics that are identified by the Myers-Briggs Type Indicator®

From individuals' responses to these four questions, each respondent was categorized into one of 16 personality types. Based upon work by Myers [9], Keirsey and Bates [10], and Tieger, Barron, and Tieger [11, 12], the 16 personality types (within four broad temperament groups) are as follows:

Traditionalists (Sensing-Judgers or SJs)

- Extravert, Sensing, Thinking, Judging (ESTJ)
- Introvert, Sensing, Thinking, Judging (ISTJ)
- Extravert, Sensing, Feeling, Judging (ESFJ)
- Introvert, Sensing, Feeling, Judging (ISFJ)

Experiencers (Sensing-Perceivers or SPs)

- Extravert, Sensing, Thinking, Perceiving (ESTP)
- Introvert, Sensing, Thinking, Perceiving (ISTP)
- Extravert, Sensing, Feeling, Perceiving (ESFP)
- Introvert, Sensing, Feeling, Perceiving (ISFP)

Conceptualizers (iNtuitive-Thinkers or NTs)

- Extravert, iNtuitive, Thinking, Judging (ENTJ)
- Introvert, iNtuitive, Thinking, Judging (INTJ)
- Extravert iNtuitive, Thinking, Perceiving (ENTP)
- Introvert, iNtuitive, Thinking, Perceiving (INTP)

Idealists (iNtuitive-Feelers or NFs)

- Extravert, iNtuitive, Feeling, Judging (ENFJ)
- Introvert, iNtuitive, Feeling, Judging (INFJ)
- Extravert, iNtuitive, Feeling, Perceiving (ENFP)
- Introvert, iNtuitive, Feeling, Perceiving (INFP)

A more complete description of these types also may be found in **Appendix B**.

Items that were used to measure the nine health-risk behaviors (smoking, exercise, alcohol consumption, nutrition, sleep, depression-related stress, anxiety-related stress, healthcare professional usage, and self-discipline), the quality of patient-physician relationships, patient-physician communication, and preferred method for receiving information in this study are summarized in **Appendix C**. These items were pretested by one of the co-authors (PT) and were included for this study so that comparisons could be made to his previous work [11, 12].

Data Collection

The data source for this study was the 2016 National Consumer Survey of the Medication Experience and Pharmacists' Roles [13]. Data were collected via an on-line, self-administered survey coordinated by Qualtrics Panels (www.qualtrics.com) from March 14-30, 2016. Data were obtained from 10,500 adult individuals residing in the United States. A complete copy of the survey is available from the corresponding author.

Data Analysis

Chi-square analysis was used for making comparisons between categories of personality types and items related to health-risk behaviors. Statistical significance was set at $p < 0.05$. However, chi-square analysis with large sample sizes (e.g. 10,500 in this study) readily yields statistical significance. Based on previous work [11, 12], practical significance was set at four or more percentage points above or below the overall mean. Such an approach not only helped identify significantly different findings but also the most salient and actionable patterns in the findings.

Results

The 10,500 respondents were representative of the overall U.S. adult population in terms of geography (see **Figure 1**).

Figure 1: Geographic Distribution of Survey Respondents (N = 10,500)

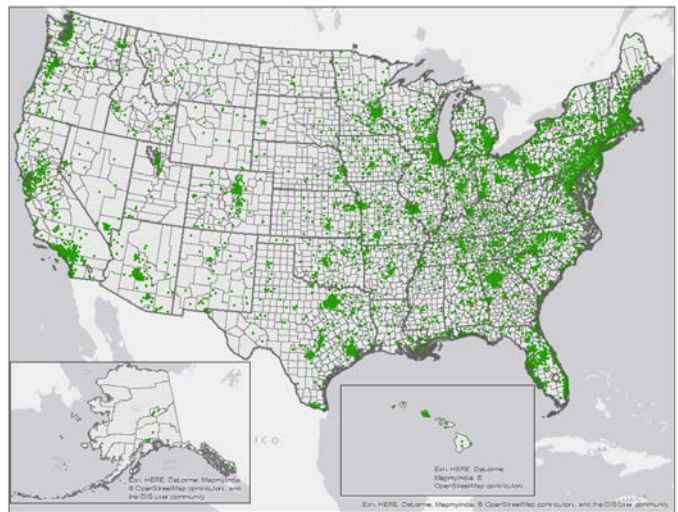


Figure 1 was developed by the Geospatial Analysis Center, University of Minnesota – Duluth, Stacey Stark, Director

Demographic characteristics of the respondents showed variation patterns that were similar to U.S. Census estimates for the adult population (see **Table 2**).

Table 2: Respondent Demographics (N = 10,500)

Characteristic	N	%	Mean
Gender			
Male	4200	40%	-
Female	6300	60%	
Age (years)			
18 to 33	2620	25%	47.5
34 to 50	31421	30%	
51 to 69	3711	35%	
70 or more	1028	10%	
Ethnic/Racial Background			
American Indian	87	1%	-
Asian	390	4%	
Black/African American	908	9%	
Latino/Latina	644	6%	
White	8271	79%	
Other	200	2%	
Marital Status			
Single (never married)	2969	28%	-
Single (separated/divorced)	1448	14%	
Married or otherwise partnered	5566	53%	
Widowed	517	5%	
Household Income			
\$20,000 or less	1949	19%	-
\$20,001 to \$40,000	2586	25%	
\$40,001 to \$60,000	2063	20%	
\$60,001 to \$80,000	1547	15%	
\$80,001 to \$100,000	950	9%	
More than \$100,000	1405	13%	
Highest Level of Education			
Less than High School Graduate	194	2%	-
High School Graduate	2085	20%	
Some College, No Degree	2935	28%	
Associate Degree	1343	13%	
Bachelor's Degree	2625	25%	
Master's Degree	1026	10%	
Professional Degree	153	1%	
Doctoral Degree	139	1%	
Prescription Medications Taken Daily (number)			
0	3937	37%	2.2
1	1853	18%	
2	1256	12%	
3	954	9%	
4	693	7%	
5	569	5%	
6	356	3%	
7	245	2%	
8	195	2%	
9	103	1%	
10	117	1%	
More than 10	339	2%	

Over-the-Counter Medications Taken Daily (number)				
	0	5427	52%	0.9
	1	2845	27%	
	2	1298	12%	
	3	486	5%	
	4	219	2%	
	5	114	1%	
	More than 5	111	1%	
Herbal Supplements Taken Daily (number)				
	0	6824	65%	0.9
	1	1550	15%	
	2	855	8%	
	3	504	5%	
	4	249	2%	
	5	209	2%	
	More than 5	309	3%	
Overall Health				
	Excellent	1423	14%	-
	Good	6056	58%	
	Fair	2618	25%	
	Poor	403	4%	
Have You Been Hospitalized in the Past Year?				
	Yes	1275	12%	-
	No	9225	88%	

Overall, 60% of the respondents were female, 79% white, and 37% had a bachelor’s degree or higher. Respondents reported a median age of 48 years and taking an average of 2.2 prescription medications daily. Fifty-eight percent of respondents reported good health and 12% reported having been hospitalized in the past year.

Detailed findings for objectives 1 and 2 are presented in **Appendix D**. Findings for the nine different health-risk behavior areas (objective 1) are summarized in Tables 3 through 11 (**Appendix D**). Findings for the three different characteristics of how patients desire to interact with their physician (objective 2) are summarized in Tables 12 through 14 (**Appendix D**). Cells with findings that are four units or more from the overall mean are highlighted and used in the presentation of the findings. This was done since chi-square analysis with large sample sizes (e.g. 10,500 in this study) readily yields statistical significance. Based on previous work [11, 12], practical significance was set at four or more percentage points above or below the overall mean. Such an approach not only helped identify significantly different findings but also the most salient and actionable patterns in the findings. As results are presented, brief discussion points are provided regarding how the findings are consistent with personality type theory [12] (**Appendix D**).

To help interpret the findings related to the first study objective, **Table 15** provides a summary of the associations between modifiable health-risk behaviors and personality types. To create this summary, findings from Tables 3 through

11 (**Appendix D**) for the nine modifiable health-risk behaviors were coded numerically with desirable findings assigned positive scores, undesirable findings assigned negative scores, and neutral findings assigned scores of zero. A score of 0 was assigned if the proportion in the table was neither above nor below the overall average by four percentage points or more. Positive scores were assigned for proportions that were at least four percentage points above or below the overall mean in a “desirable direction.” Negative scores were assigned for proportions that were at least four percentage points above or below the overall mean in an “undesirable direction.” The size of the score varied depending on the severity of the item.

Findings in Table 3 can serve as an example. For the item “I have never smoked” proportions significantly above the overall average (cells highlighted in green) were given scores of 1 and proportions significantly below the overall average (cells highlighted in red) were given scores of -1. Other cells were given scores of 0. For the item, “I don’t currently smoke”, green highlighted cells were given a score of 1 and red cells were given a score of -1 (other cells given scores of 0). For “I smoke occasionally,” green cells were given a score of -1 (no red cells). For “I smoke less than one pack a day,” green cells were given a score of -2 (no red cells). For “I smoke one or more packs a day,” green cells were given a score of -3 (no red cells). Then, these scores were summed for each personality type. This approach was repeated for each table (3 through 11) to create Table 15. The full audit trail for how scores were assigned and sums computed may be obtained from the corresponding

author. The goal for this approach was to develop a summary so that the 16 personality types could be compared and contrasted across the nine modifiable health-risk behaviors. Table 15 shows the computed score for each personality type. In addition, the number of cells with negative scores (range from zero cells to all nine cells) is reported in Table 15.

Table 15: Associations between Modifiable Health-Risk Behaviors and Personality Types (N=10,500)

Health-Risk Behavior	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207			
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650
	E S T J	I S T J	E S F J	I S F J	E S T P	I S T P	E S F P	I S F P	E N T J	I N T J	E N T P	I N T P	E N F J	I N F J	E N F P	I N F P
Smoking	0	0	1	1	-8	-3	0	0	-2	0	-2	0	0	1	-2	0
Lack of exercise	5	0	-3	-3	-5	-2	0	-10	6	6	1	3	0	0	3	-4
Alcohol abuse	-4	0	0	8	-12	-6	0	3	-9	0	-9	-6	-2	8	-5	0
Poor nutrition	3	0	0	4	-9	-9	-4	-5	-1	4	-6	-2	7	6	-4	-2
Sleep issues	3	0	0	0	-8	-5	0	-3	3	3	1	0	-3	0	-5	-8
Depression	13	12	0	0	-8	-7	0	-6	2	6	10	-4	0	-2	-8	-12
Anxiety	10	12	0	0	-5	0	-6	-2	0	11	2	0	-3	-6	-13	-16
Healthcare Provider usage	6	0	6	3	-6	-6	3	-3	2	0	0	-4	6	0	2	-1
Poor self-discipline	5	5	0	0	-5	-5	-5	-5	5	5	0	0	5	0	-5	-5
OVERALL n = 10,500	41	29	4	13	-66	-43	-12	-31	6	35	-3	-13	10	7	-37	-48
Number of cells with negative scores	1	0	1	1	9	8	3	7	3	0	3	4	3	2	7	7

Table 15 shows that two types - ESTPs and ISTPs - have the highest number of negative scores for the nine health-risk behaviors. ESTPs have negative scores for all nine risk behaviors, and ISTPs have negative scores for eight of the nine. These two types alone – which belong to the Experiencer temperament – represent about 10% of the US population [14] but account for 29% of the negative scores we computed (17 out of the 59). The other two Experiencer types are ESFP and ISFP. In total, Experiences represent 27% of the US population [14], but account for 46% (27 out of 59) of the negative scores we computed. Not only did Experiencers have the highest number of negative scores (27), but they included every category of modifiable health-risk behaviors. These findings are not surprising given that Experiencers greatly value living in the

moment, enjoying their lives, not being constrained by rules or convention, are prone to taking risks and tend not to worry about future consequences of their behavior [12].

Following Experiencers, the temperament with the next highest number of health-risk behaviors at 19 is Idealists (ENFJs, INFJ, ENFPs and INFPs). Idealists tend to be extremely sensitive and introspective. Innately empathetic, they can experience intense disappointment when things don't happen the way their deeply held values dictate that they should [12]. Not surprising, the three modifiable health-risk behaviors most challenging for Idealist types are psychologically and emotionally based problems: anxiety, depression and poor sleep. Idealists represent about 17% of the US population [14],

but account for 32% of the negative scores we computed (19 out of 59).

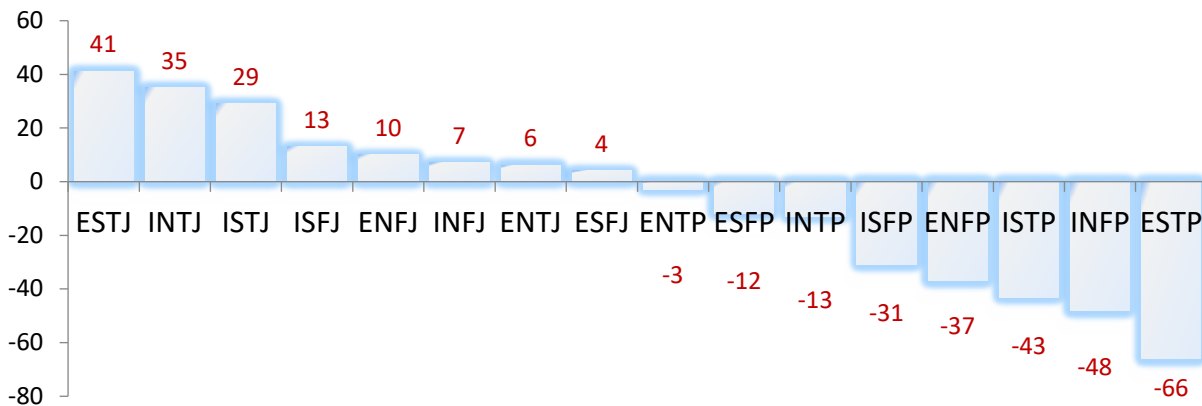
Conceptualizers (NTs), which consist of ENTJs, INTJs, ENTPs and INTPs had a total of 10 negative scores in Table 15. Conceptualizers represent about 10% of the population [14] and account for about 17% of the negative scores we computed (10 out of 59). Seven of the ten negative scores were for the Intuitive-Thinking-Perceivers (NTPs), who are characteristically less self-disciplined than Intuitive-Thinking-Judgers (NTJs). INTJs – among the most self-disciplined of all types - had no negative scores. Alcohol abuse constitutes the paramount health-risk behavior for Conceptualizers, perhaps for a combination of reasons: they are high achievers who tend to work and play hard, so they may turn to alcohol to reduce stress. Also, because they are not naturally sensitive or tuned-in to the feelings of others, they may be less aware of and/or concerned about the impact of their excessive drinking on those around them [12].

Not surprising, Traditionalists (ESTJ, ISTJ, ESFJ and ISFJ) had the fewest negative scores. Although they represent about 46% of the US population [14], they accounted for only 5% of the

negative scores we computed (3 out of 59). Traditionalists, as their name implies tend to be conventional, conservative and extremely responsible people who find comfort in structure, following rules and reflexively trust authority figures, such as physicians. By definition, all Traditionalists are also Judgers (J), typically serious, conscientious and as this research showed, highly self-disciplined [12].

Figure 2 shows the scores that were computed for each personality type in rank order from highest to lowest. Three personality types (ESTJ, INTJ, and ISTJ – all Thinking-Judgers) had the highest scores, ranging from 41 to 29. Eight personality types (ISFJ, ENFJ, INFJ, ENTJ, ESFJ, ENTP, ESFP, and INTP) had scores in a middle range (13 to -13). The remaining five types (ESTP, ISTP, ISFP, ENFP and INFP) had the lowest scores, ranging from -31 to -66. These five types represent about 39% of the US population [14], but account for 64% of the computed negative scores in Table 15. Three of the four Experienter types are in this group (ESTP, ISTP and ISFP). These three types represent 19% of the US population [14], but account for 41% (24 out of 59) of the negative scores we computed in Table 15.

Figure 2: Overall Scores Reported in Table 15 Ordered from Highest to Lowest



The findings showed that there are identifiable health-risk behaviors associated with personality type and that these associations were consistent with theory [9-12] and previous research [7, 15]. With that in mind, the **second objective for this study** was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information. The second objective reveals how personality types are associated with

how best to communicate specific strategies that would be employed to change health -risk behaviors.

Findings presented in Tables 12 to 14 (**Appendix D**) showed that personality type was associated with: (1) the importance people place on the patient-physician relationship, (2) which characteristics of that relationship are most desirable, (3) desire for more communication with their physician, and (4) the preferred method for receiving information. Therefore, just as findings for objective 1 showed that individuals with differing personality types vary in terms of how they present with and

view health-risk behaviors, objective 2 showed that individuals with differing personality types vary in terms of how they want to interact with their physician. This is important since physician communication style has been shown to be correlated with better patient adherence to treatment [19] and that health care communication that is tailored to personality type can better meet patients' needs and priorities [20].

Discussion

The **first objective for this study** was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with the following modifiable health-risk behaviors: smoking, exercise, alcohol consumption, nutrition, sleep, depression-related stress, anxiety-related stress, healthcare professional usage, and self-discipline. This would help identify if personality type is associated with the likelihood of presenting with health-risk behaviors in the first place. The **second objective for this study** was to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information. The second objective reveals how personality types are associated with how best to communicate specific strategies that would be employed to change health-risk behaviors.

Overall, the findings showed that personality type is associated with the likelihood of presenting with a modifiable health-risk behavior and with variation in how individuals wish to interact with their physician and how they wish to receive health information. Furthermore, some of these variations are not congruent with the current processes used in the health care system. For example, "Experiencers" greatly value living in the moment, enjoying their lives, and not being constrained by rules or convention. They are prone to taking risks and tend not to worry about future consequences of their behavior. Being scolded by a health care professional and told what to do is not likely to obtain the desired outcome with this temperament type. As another example, "Idealists" tend to be extremely sensitive and introspective. Innately empathetic, they can experience intense disappointment when things don't happen the way their deeply held values dictate that they should. Being rushed or not listened to by health care providers is not congruent with this temperament type, and actually may produce the opposite of the desired effect.

Precision medicine has been proposed as a way to create a new taxonomy of disease that uses individual specific data to develop accurate diagnosis, targeted treatment, and improved health outcomes [16-18]. We propose that inclusion of personality type is an important component of these efforts so that the health care system can conform more to the individual patient rather than expecting individuals to conform to a rigid health care system. Just as small genetic differences can result in large variation in treatment response [16-18], small

differences in personality characteristics can result in large variation in treatment response as well due to: (i) how people are energized, (ii) the kind of information they naturally notice, (iii) how they prefer to make decisions, and (iv) their preferences to live in a more structured way or in a more spontaneous way [7-12].

Such an approach will require change and resources. We propose that greater alignment between systems of care and individuals will increase engagement and adherence, reduce errors, minimize ineffective treatment and waste, and can be cost effective. Personality-specific tools already exist such as Individualized Wellness Plans™ [7] and the Adherence Predictive Index™ [15] for shaping the health care system to meet individual preferences. Physicians and other healthcare providers can increase their effectiveness with patients by learning to conform more to patients' preferred styles for interacting with the health care system. This research has novel, practical applications to help (1) identify individual patient's health-risk behaviors, (2) predict their likelihood of being adherent to prescribed treatments, (3) communicate with patients in their preferred style, (4) recommend customized strategies to mitigate health-risk behaviors, and (5) overcome anxiety patients experience in the health care system when it does not conform to their preferences [11-12].

Limitations

Limitations of the study should be noted when interpreting the findings. First, respondents to the survey were part of a panel and may not be representative of the whole United States adult population. Overall, the respondents in this study were matched well with census estimates for the adult population in terms of geographic location, race, gender, education, income, and age [7]. Also, the goal of this study was not to make population estimates. Rather the goal was to use the data to describe associations between study variables using a relatively large sample. If population estimates were of interest, weighting of the data to match the population of interest would be needed. Second, the preferences for engaging in activities associated with health-risk behaviors were self-reported and not based on actual behavior data. It is possible that self-reports are biased.

Finally, the application of personality type has limitations such as the amount of variance explained and applicability in certain situations [21-23]. We acknowledge these limitations and were careful to apply a validated personality type measure (Preferred Communication Style Questionnaire) that had direct relevance to health-risk behaviors. In addition, we draw on the application of personality type in multiple disciplines to influence and improve behavior including such examples as helping managers understand, engage and retain employees, helping teams collaborate more successfully, and helping individuals communicate more effectively in the workplace [11, 12]. This

study investigated the application of Personality Type Theory for patient care management objectives in health care.

Conclusions

The objectives for this study were to explore if characteristics of personality type (using the Preferred Communication Style Questionnaire) are associated with nine modifiable health-risk behaviors and to explore if characteristics of personality type are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information. Findings showed that personality type was associated with all nine health-risk behaviors studied. Personality types within the Experiencer temperament (17% of the U.S. population) accounted for 46% of the undesirable scores we computed for health-risk behaviors. The Idealist temperament (17% of population) accounted for 32% of the undesirable scores. Conceptualizers (10% of population) accounted for 17% of the undesirable scores and Traditionalists (46% of population) accounted for 5% of the undesirable scores. The findings also showed that personality type was associated with (1) the importance people place on the patient-physician relationship, (2) which characteristics of that relationship are most desirable, (3) desire for more communication with their physician, and (4) the preferred method for receiving information.

There are several practical applications for the findings:

- Patients, health care providers, and caregivers can be made aware of the variation among individuals for engaging in specific health-risk behaviors and for developing certain health conditions.
- Providers can recommend tools and strategies that are well-suited to unique individuals for helping reduce health-risk behaviors. Examples of these include the Individual Wellness Plan™ [7] and the Adherence Predictive Index™ [15].
- Healthcare stakeholders can apply these findings and tools to reduce costs associated with chronic illnesses attributed to health-risk behaviors.
- Healthcare providers can increase their effectiveness with patients by learning to communicate with each individual in a way that is congruent with his or her communication style.
- Researchers should consider the impact that personality type can have on health behaviors and outcomes when designing research studies.

Precision medicine has been proposed as a way to create a new taxonomy of disease that uses individual specific data to develop accurate diagnosis, targeted treatment, and improved health outcomes [16-18]. We propose that inclusion of personality type is an important component of these efforts so that the health care system can conform more to the individual patient rather than expecting individuals to conform to a rigid

health care system. Such an approach will require change and resources. We propose that greater alignment between systems of care and individuals will increase engagement and adherence, reduce errors, minimize ineffective treatment and waste, and can be cost effective.

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Use of the proprietary, copyrighted tool: the "Preferred Communication Style Questionnaire" was obtained from Paul D. Tieger, SpeedReading People, LLC, 100 Allyn Street, Hartford, CT 06103, paul@speedreadingpeople.com.

The Individualized Wellness Plan™ and Adherence Predictive Index™ are copyrighted by SpeedReading People, LLC, 100 Allyn Street, Hartford, CT 06103, paul@speedreadingpeople.com.

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Appendix A

Preferred Communication Style Questionnaire

Use of the proprietary, copyrighted tool: the "Preferred Communication Style Questionnaire" was obtained from Paul D. Tieger, SpeedReading People, LLC 100 Allyn Street, Hartford, CT 06103, paul@speedreadingpeople.com.

Would you rather talk with lots of different people, or have an in depth conversation with one person?

Style A:

You get excited and energized by being around people. You may have many friends and like to have a lot of people in your life.

You tend to:

- Enjoy talking with people
- Make new friends easily
- Prefer to do many things at once
- Answer questions quickly
- Think out loud
- Be comfortable talking with strangers
- Sometimes be easily distracted

OR

Style B:

While you like people, you also enjoy spending quiet time by yourself. You usually prefer a small group of close friends.

You tend to:

- Be a good listener
- Develop a few, but deep friendships
- Devote time to the friends you already have
- Take your time answering questions
- Think before you speak
- Prefer to talk with people you know, rather than strangers
- Be good at concentrating on a task

Which style seems to fit you best?

- Style A
- Style B

Are you more of a realistic person who pays attention to what is happening now? Or a person who thinks about what may happen in the future?

Style A:

You'd rather talk about real things than ideas that don't have much practical use. You have good common sense and appreciate others who do, too.

You tend to:

- Pay attention to details and specifics
- Appreciate practical solutions
- Be pretty realistic and "down to earth"
- Remember important facts and details
- Trust things that you know from your own past experience
- Prefer using skills you already have
- Be aware of what's going on in the present moment

OR

Style B:

You enjoy thinking about new ideas and possibilities. You are good at seeing how ideas are related and connected to each other.

You tend to:

- See “the big picture”
- Appreciate new or creative ideas, even if they are untested
- Enjoy using your imagination
- Look for and see the deeper meaning in things
- Trust your hunches and “gut instincts”
- Enjoy learning new skills
- Think more about the future than the present

Which style seems to fit you best?

- Style A
- Style B

Do you tend to make decisions based more on logic or on your personal feelings?

Style A:

You are most convinced by logical arguments. You tell the truth even if it might hurt someone’s feelings.

You tend to:

- Look at things objectively, not personally
- Try to treat everyone fairly
- Be competitive
- Take few things personally
- See and point out, how things can be improved
- Sometimes find it fun to argue or debate
- Be motivated to achieve

OR

Style B:

When making a decision, you consider how people will feel about it. You tend to avoid arguments and conflicts.

You tend to:

- Be aware of other’s feelings
- Try to treat everyone kindly
- Be cooperative
- Sometimes take things too personally
- Not criticize others if it will upset them
- Want people to get along and be happy
- Be motivated to help others

Which style seems to fit you best?

- Style A
- Style B

Do you prefer to live in a more planful, organized way? Or a more open-ended, spontaneous way?

Style A:

You like things decided and feel best when you've got a plan. And once you've made a plan, you like to stick with it.

You tend to:

- Take your responsibilities seriously
- Be sure to prepare in advance
- Feel best when you finish projects
- Like to cross things off your "to do" list
- Find it easy making most decisions
- See the need for most rules
- Almost always be on time

OR

Style B:

You like to keep your options open before making some decisions. And, you're often comfortable changing plans when necessary.

You *tend* to:

- Like to mix business with pleasure
- Complete some tasks at the last minute
- Often enjoy starting new projects best
- Don't always finish items on your "to do" list
- Find it easy to be flexible
- Question the need for many rules
- Sometimes be late for appointments

Which style seems to fit you best?

- Style A
- Style B

Appendix B

Description of Personality Types within Four Broad Temperament Groups [7]

Traditionalists (Sensing-Judgers or SJs) – This temperament group consists of the four personality types listed below that value most being responsible and of service. They tend to be realistic and hardworking and possess a serious, no-nonsense demeanor. They like structure, respect authority, pay attention to facts, details and specifics, and are typically very self-disciplined.

- **Extraverted, Sensing, Thinking, Judging (ESTJ):** Get things done, responsible, dependable, practical, hardworking, logical, analytical, detail-oriented, organized
- **Introverted, Sensing, Thinking, Judging (ISTJ):** Serious, responsible, dependable, practical, hardworking, logical, analytical, detail-oriented, organized
- **Extraverted, Sensing, Feeling, Judging (ESFJ):** Practical, sympathetic, sensitive, responsible, conscientious, hard-working, collaborative, traditional.
- **Introverted, Sensing, Feeling, Judging (ISFJ):** Loyal, devoted, sympathetic, sensitive, responsible, conscientious, hard-working, collaborative, traditional, helpful

Experiencers (Sensing-Perceivers or SPs) – This temperament group consists of the four personality types listed below that value most their freedom, enjoying the moment and living their lives unrestrained. They are practical and realistic with a casual, playful demeanor, are prone to taking risks, and are typically not very self-disciplined.

- **Extraverted, Sensing, Thinking, Perceiving (ESTP):** Active, easygoing, pragmatic, fun loving, realistic, casual, responsive, present-oriented, observant, adaptable
- **Introverted, Sensing, Thinking, Perceiving (ISTP):** Straightforward, honest, pragmatic, fun loving, realistic, casual, responsive, present-oriented, observant, adaptable
- **Extraverted, Sensing, Feeling, Perceiving (ESFP):** Sensitive, gentle, practical, realistic, present-oriented, observant, nurturing, cooperative; having a zest for life
- **Introverted, Sensing, Feeling, Perceiving (ISFP):** Gentle, caring, sensitive, humble, practical, realistic, present-oriented, observant, nurturing, cooperative

Conceptualizers (iNtuitive-Thinkers or NTs) – This temperament group consists of the four personality types listed below that value most competence, excellence and success. They are independent, strategic, creative problem solvers with high standards and motivated by intellectual challenge. They tend to have a confident and assertive demeanor and strong opinions.

- **Extraverted, iNtuition, Thinking, Judging (ENTJ):** Inspiring leaders, logical, analytical, strategic, innovative, intellectual, confident, organized, goal-oriented
- **Introverted, iNtuition, Thinking, Judging (INTJ):** Perfectionists, logical, analytical, strategic, innovative, independent, intellectual, confident, organized, goal-oriented
- **Extraverted, iNtuition, Thinking, Perceiving (ENTP):** Love challenge, creative, logical, analytical, flexible, strategic, confident, inspirational, complex, perceptive
- **Introverted, iNtuition, Thinking, Perceiving (INTP):** Conceptual problem solvers, creative, logical, analytical, flexible, strategic, confident, complex, perceptive

Idealists (iNtuitive-Feelers) – This temperament group consists of the four personality types listed below that value most meaningful relationships, individuality, uniqueness and personal growth. They have a collaborative, helpful demeanor and tend to be excellent communicators and talented creative problem solvers, especially when it comes to helping other achieve their goals.

- **Extraverted, iNtuition, Feeling, Judging (ENFJ):** People-lovers, empathetic, creative, idealistic, goal-oriented, collaborative, tactful, original, productive, communicative
- **Introverted, iNtuition, Feeling, Judging (INFJ):** Independent, empathetic, creative, idealistic, integral, goal-oriented, committed, tactful, original, productive
- **Extraverted, iNtuition, Feeling, Perceiving (ENFP):** Enthusiastic, idealistic, creative, perceptive, collaborative, communicative, unconventional, spiritual, flexible, empathetic
- **Introverted, iNtuition, Feeling, Perceiving (INFP):** Inner harmony, idealistic, creative, perceptive, communicative, unconventional, flexible, empathetic

Appendix C
Survey Questions for Variables Used in this Study

Smoking

With regards to cigarette smoking, which is most true for you?

- I have never smoked
- I don't currently smoke
- I smoke occasionally
- I smoke less than one pack a day
- I smoke one or more packs a day

Exercise

How many days per week do you exercise 30 minutes or more?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

What is your primary motivation to exercise?

- I don't have any motivation to exercise
- To feel good / to feel better
- To look good / to look better
- To stay healthy
- To avoid being a burden to my family if I get sick
- To advance my career
- Other (specify) _____

Alcohol Consumption

How often do you drink alcohol in a typical week?

- 7 days per week
- 6 days per week
- 5 days per week
- 4 days per week
- 3 days per week
- 2 days per week
- 1 day per week
- 0 days per week

Do you have more than 4 drinks (men) / 3 drinks (women) in one sitting? ____ Yes ____ No

Do you consume more than 21 drinks (men) / 14 drinks (women) per week? ____ Yes ____ No

Nutrition

How often do you eat fast food per week?

- Very often (5 or more times a week)
- Fairly often (2-4 times a week)
- Seldom (about once a week)
- Rarely (once in a while, less than once a week)
- Never

How would you describe your eating habits?

- I pay a lot of attention to what I eat
- I pay some attention to what I eat
- I pay little attention to what I eat

Sleep

On average, how much sleep do you get each night?

- Less than 6 hours
- About 6 hours
- About 7 hours
- About 8 hours
- More than 8 hours

For most days, how would you rate the quality of the sleep you get?

- Very good – I usually wake up feeling refreshed
- Pretty good – on most days I wake up feeling refreshed
- Not very good – I wake up tired a fair amount of days
- Poor – I often wake up tired

Depression-related Stress

Over the last 2 weeks, how often have you been bothered by the following problems:

- Feeling down, depressed, or hopeless
 - ___ Not at all
 - ___ Several days
 - ___ More Than Half the Days
 - ___ Nearly Every Day

- Little interest or pleasure in doing things
 - ___ Not at all
 - ___ Several days
 - ___ More Than Half the Days
 - ___ Nearly Every Day

Anxiety-related Stress

Over the last 2 weeks, how often have you been bothered by the following problems:

- Feeling nervous, anxious, or on edge
 - ___ Not at all
 - ___ Several days
 - ___ More Than Half the Days
 - ___ Nearly Every Day

- Not being able to stop or control worrying
 - ___ Not at all
 - ___ Several days
 - ___ More Than Half the Days
 - ___ Nearly Every Day

Health Professional Usage

How important do you think it is for you to get an annual physical examination?

- Very important
- Somewhat important
- Not very important
- Not at all important

Which of these statements best describes how you feel about going to see a doctor?

- I don't hesitate to see a doctor if I'm feeling anxious about a health concern
- I go to a doctor only if I feel sick
- I tend to avoid doctors unless it is absolutely necessary

Self-Discipline

How self-disciplined are you in terms of reaching personal goals you set for yourself, such as losing weight, getting enough exercise, etc.

- Very self-disciplined – I almost always accomplish my goals
- Pretty self-disciplined – I usually accomplish my goals
- Somewhat self-disciplined – I start off strong, but often give up before I reach my goal
- Not very self-disciplined – I usually have a hard time reaching my goals

Patient-Physician Relationship

How important is it for you to have a good relationship with your primary care doctor?

- Very important
- Somewhat important
- Not very important
- Not at all important

Besides being competent, what is most important quality you'd like your doctor to have?

- Being a patient listener
- Genuinely expressing care for me
- Involving me in the process
- Taking time to explain things thoroughly
- Other (specify) _____

Patient-Physician Communication

Does your primary care doctor communicate with you in the way you want to be communicated with?

___ YES ___ NO

How much more effective do you think your doctor would be if he or she were able to communicate with you in the way you want to be communicated with?

- A great deal more effective
- More effective
- Somewhat more effective
- Not any more effective

Preferred Method for Receiving Information

Do you tend to learn and remember things better when you hear them or when you see them?

- Hear them
- See them
- I don't know

Appendix D Detailed Findings

Smoking

Table 3 summarizes results related to smoking behavior. Forty-nine percent of respondents reported that they never smoked. The two types that most frequently reported that they never smoked were INFJs and ISFJs. Both of these types are Introverts (I), Feelers (F) and Judgers (J), characteristically thoughtful, cautious, disciplined people. Four types reported that they don't currently smoke (meaning they have at one

time, though the survey did not ask when or for how long) more frequently than the overall average. Of these, three of the four are more disciplined Judgers (J), and two are the conservative and conventional Traditionalists (SJs) [12]. The two types who smoke the most - ESTPs and ISTPs are both Experiencers (SPs), people who like to live in the moment, don't worry about future consequences and are comfortable taking risks [12].

Table 3: Prevalence of Smoking-related Habits and Perceptions by Temperament and Personality Style (N=10,500)

Smoking-related habits and perceptions	Traditionalists – SJ <i>n</i> = 1367				Experiencers – SP <i>n</i> = 1200				Conceptualizers – NT <i>n</i> = 4726				Idealists –NF <i>n</i> = 3207			650	10500
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215		
	E S T J	I S T J	E S F J	I S F J	E S T P	I S T P	E S F P	I S T P	E N T J	I N T J	E N T P	I N T P	E N F J	I N F J	E N F P		
	With regards to cigarette smoking, which is most true for you?																
I have never smoked (%)	43	49	47	54	43	40	46	51	43	48	45	42	44	54	42	48	49
I don't currently smoke (%)	32	28	31	27	16	30	27	26	29	26	25	31	32	25	30	24	27
I smoke less than one pack a day (%)	11	12	11	10	20	17	15	12	13	15	13	12	12	11	14	13	12
I smoke occasionally (%)	8	4	5	3	12	7	6	4	10	6	13	8	7	5	10	8	6
I smoke one or more packs a day (%)	6	7	5	6	10	6	5	7	5	6	5	7	5	6	5	7	6

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Exercise

Table 4 summarizes results relating to exercise habits. The three types that most frequently reported that they don't exercise for 30 minutes or more per week – ISFP, ISFJ and ESFJ – are all Sensors (S), with two of the three being Introverts (I). According to personality type theory [12], ISFPs may fall into this group because they are characteristically laid back, not particularly self-disciplined, typically not very ambitious or proactive, and prone to procrastination. ESFJs and ISFJs tend to be responsible, hardworking, selfless people, who often put others' needs ahead of their own. It is possible that they are

too busy fulfilling their work responsibilities or taking care of others to prioritize self-care.

Among the three types that exercised the most, two were "Conceptualizers." Consistent with personality type theory [12], Conceptualizers are strategic, driven to succeed, competitive, and set very high standards for themselves and others. Of the Conceptualizer group, two types – ENTJ and INTJ – exercised the most (five times or more per week). This is expected, since these types are not only Conceptualizers, but they are also Judgers (J) –among the most goal-oriented and self-disciplined people.

Regarding respondents' primary motivation to exercise, two types – **ESTPs** and **ISFPs** – more frequently reported than the overall average that they “don't have any motivation to exercise.” This may be attributed to their prioritizing enjoyment over work. With regards to their primary motivation to exercise, two Idealist types – **ENFPs** and **INFPs**, and all four Experiencers (**ESTP**, **ISTP**, **ESFP** and **ISFP**) reported that “staying healthy” was their primary motivation less frequently than the overall average. Consistent with personality type theory, Experiencers may not see a direct connection between exercising and staying healthy. Or, they may see it, but are not self-disciplined enough to do it. Also, all

six of these types are Perceivers (P), people who are characteristically prone to procrastination, and may rationalize unhealthy behavior by believing that “there's always tomorrow.” Only two types reported that their primary motivation was to stay healthy more than the overall average – the well-disciplined **ESTJs** and **INTJs**. The four types that reported that their primary motivation was “to look good / to look better” more frequently than the overall average were all Extraverts – people who are more tuned into the “outer world” and more concerned about how they may be perceived by others.

Table 4: Prevalence of Exercise-related Habits and Motivations by Temperament and Personality Style (N=10,500)

Exercise-related Habits and Motivations	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V E R A L L
	485 E S T J	148 I S T J	528 E S F J	206 I S F J	322 E S T P	254 I S T P	375 E S F P	249 I S F P	1396 E N T J	405 I N T J	2318 E N T P	607 I N T P	870 E N F J	472 I N F J	1215 E N F P	650 I N F P	
How many days per week do you exercise 30 minutes or more?																	
1/2/3/4 (%)	49	51	47	50	51	53	54	52	54	53	56	57	53	55	60	55	53
0 (%)	23	28	30	31	29	27	25	34	16	20	20	21	23	25	20	28	26
5/6/7 (%)	28	21	23	19	20	20	21	14	30	27	24	22	24	20	20	17	21
What is your primary motivation to exercise?																	
To stay healthy (%)	38	35	31	34	28	27	28	25	30	37	28	29	34	31	23	26	32
To feel good/ to feel better (%)	21	23	27	23	18	25	29	26	29	25	24	27	27	28	33	30	26
I don't have any motivation to exercise (%)	21	25	20	26	29	26	19	30	15	20	17	21	20	21	17	21	23
To look good/ to look better (%)	14	12	16	12	17	16	19	14	18	13	22	16	16	15	22	17	14
Other; specify (%)	5	4	4	3	4	4	3	3	5	2	7	4	1	4	1	3	3
To avoid being a burden to my family if I get sick (%)	1	1	2	2	1	1	1	2	3	2	1	1	1	1	3	2	1
To advance my career (%)	1	1	1	1	3	1	1	1	0	1	2	2	1	1	1	1	1

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Alcohol consumption

Table 5 summarizes results relating to alcohol consumption. ESTJs, ESTPs and ENTPs reported consuming alcohol at least 4 days per week more frequently than the overall average. Six types reported drinking more than 4 drinks (men) and 3 drinks (women) at a single sitting, which is considered “binge drinking”, more frequently than the overall average. Five of these types are the more laid back and fun-loving Perceivers (P), and five were Thinkers (T). A possible explanation that is consistent with personality type theory is that thinkers tend to be more self-absorbed and less sensitive to the effect of their (potentially negative alcohol-induced) behavior on others. Included in this group were three Conceptualizers – ENTP, INTP and ENTJ, two Experiencers – ESTP and ISTP, and one Idealist – ENFP.

Two types reported that they consumed more than 21 drinks (men) and 14 drinks (women) in one week more frequently than the overall average: ENTJs and ESTPs. ENTJs are the most hard-driving, ambitious and career-focused type, and may of the four free-spirited “live for the day” Experiencer types – ESTP and ISTP.

consume alcohol to reduce stress. ESTPs are the most pleasure-focused type, whose joy comes from living in the moment. They are also prone to taking risks, and tend not to worry much about future consequences of their behavior.

The two types that reported drinking more than 4 drinks (men) and 3 drinks (women) less frequently than the overall average were the thoughtful, cautious, self-disciplined ISFJs and INFJs. Both are Introverts (I), Feelers (F) and Judgers (J), characteristically thoughtful, sensitive, reserved, and cautious people - neither would likely be described as “partiers.” Among the seven more “moderate” drinkers (those consuming alcohol between one and three days per week), five were the more social Extraverts (E), and five the more playful and casual Perceivers (P). The two types with the highest scores were ESTP and ENTP. These types are among the most social and fun-loving of all the sixteen types. Also included in the group that reported drinking the most, were three of the four Conceptualizers, and two

Table 5: Prevalence of Alcohol Consumption Patterns by Temperament and Personality Style (N=10,500)

Alcohol Consumption Patterns	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V E R A L L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E S T J	I S T J	E S F J	I S F J	E S T P	I S T P	E S F P	I S T P	E N T J	I N T J	E N T P	I N T P	E N F J	I N F J	E N F P	I N F P	
	How often do you drink alcohol in a typical week?																
0 days per week (%)	46	52	56	60	42	48	51	57	44	51	39	46	51	62	51	55	54
3 days per week/ 2 days per week/ 1 day per week (%)	38	37	32	30	43	40	35	36	42	38	46	42	39	30	39	35	35
7 days per week/ 6 days per week/ 5 days per week/ 4 days per week (%)	16	11	12	10	15	12	14	7	14	11	15	12	10	8	10	10	11
	Do you have more than 4 drinks (men) / 3 drinks (women) in one sitting?																
YES (%)	19	16	16	11	30	24	18	16	24	15	28	20	19	12	24	17	16
	Do you consume more than 21 drinks (men) / 14 drinks (women) per week?																
YES (%)	9	5	8	4	15	9	8	4	10	5	9	6	5	3	7	6	6

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Food / Nutrition

Table 6 summarizes results relating to nutrition-related habits. With regards to consuming fast food, six types reported that they ate fast food fairly often (2-4 times a week) or very often (five or more times a week) more frequently than the overall average. Five of the six were Extraverts (E) and five were Perceivers – people who are prone to impulsivity and lack self-discipline. Two of the types which consume the most fast food were Conceptualizers (ENTJ and ENTP), one was an Idealist (ENFP) and three were Experiencers: ESFPs, ESTPs, and ISTPs.

Another nutrition health-risk marker is how much attention people pay to what they eat. Three of the four types who

reportedly paid the least amount of attention were Experiencers (ESTPs, ISTPs and ISFPs). Experiencers value and pride themselves on their ability to live in the moment, unrestrained, and tend not to worry about things that may happen in the future (such as illness resulting from a poor diet). Also, Experiencers are most comfortable with what they know and less likely to embrace unproven theories about nutrition.

Not surprisingly, the two types who consumed the least amount of fast food (once in a while or less than once a week) were ISFJs and INFJs. Both of these types are Introverts (I), Feelers (F), and Judgers (J), typically prudent, thoughtful, cautious and self-disciplined.

Table 6: Prevalence of Nutrition-related Habits by Temperament and Personality Style (N=10,500)

Nutrition-related Habits	Traditionalists – SJ <i>n</i> = 1367				Experiencers – SP <i>n</i> = 1200				Conceptualizers – NT <i>n</i> = 4726				Idealists –NF <i>n</i> = 3207				10500 O V R , L
	485 E S T J	148 I S T J	528 E S F J	206 I S F J	322 E S T P	254 I S T P	375 E S F P	249 I S F P	1396 E N T J	405 I N T J	2318 E N T P	607 I N T P	870 E N F J	472 I N F J	1215 E N F P	650 I N F P	
How often do you eat fast food per week?																	
Rarely; once in a while, less than once a week/Never (%)	48	50	51	53	39	43	42	48	44	48	39	49	45	53	40	46	49
Seldom; about once a week (%)	29	31	29	31	33	31	33	30	28	34	30	28	37	28	28	30	30
Very often; 5 or more times a week/ Fairly often; 2-4 times a week (%)	23	19	20	16	28	26	25	22	28	18	31	23	18	19	32	24	21
How would you describe your eating habits?																	
I pay some attention to what I eat (%)	51	56	53	58	57	59	53	59	51	54	51	58	52	56	56	59	56
I pay a lot of attention to what I eat (%)	33	28	31	27	20	21	29	19	32	33	28	24	36	32	25	23	28
I pay a little attention to what I eat (%)	16	16	16	15	23	20	18	22	17	13	21	18	12	12	19	18	16

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Sleep

Table 7 summarizes results relating to sleep habits. ESTPs reported getting less than 6 hours of sleep per night more frequently than the overall average. According to personality type theory [12], ESTPs tend to be undisciplined, don't like to follow rules or routines, and may be less likely to engage in regimented sleep hygiene practices, such as going to bed at the same time every night, keeping their bedroom cool and dark, and not eating or drinking, or watching TV a few hours before going to sleep.

Four types reported that the quality of their sleep was either very good ("I usually wake up feeling refreshed") or pretty good ("On most days I wake up feeling refreshed") more frequently than the overall average. Three of the four are Conceptualizers (ENTJ, INTJ and ENTP), and all are Thinkers (T). According to

personality type theory [12], a plausible explanation is that Thinkers in general, and Intuitive Thinkers (NTs) in particular tend to be logical, analytical, thick-skinned, and less prone to worrying.

Of the six types who described their sleep quality as either not very good ("I wake up tired a fair amount of days") or poor ("I often wake up tired") more frequently than the overall average, three are Experiencers (ESTP, ISTP and ISFP). As mentioned earlier, this is most likely due to poor sleep hygiene habits. The other three types who reported having either "not very good" or "poor" sleep are all Idealists (ENFJ, ENFP and INFP). Idealists tend to be introspective, hyper-sensitive with rich imaginations [12]. They are often worriers, prone to anxiety and depression which is likely to contribute to their poor quality of sleep.

Table 7: Prevalence of Sleep-related Habits by Temperament and Personality Style (N=10,500)

Sleep-related Habits	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V E R , L
	485 E S T J	148 I S T J	528 E S F J	206 I S F J	322 E S T P	254 I S T P	375 E S F P	249 I S F P	1396 E N T J	405 I N T J	2318 E N T P	607 I N T P	870 E N F J	472 I N F J	1215 E N F P	650 I N F P	
	On average, how much sleep do you get each night?																
About 6 hrs/ About 7 hrs (%)	55	55	54	56	58	58	58	58	55	55	52	56	58	54	51	52	56
About 8hrs/ More than 8 hours (%)	30	27	27	29	18	24	28	26	30	29	31	27	29	31	30	27	28
Less than 6hrs (%)	15	18	19	15	24	18	14	16	15	16	17	17	13	15	19	21	16
	For most days, how would you rate the quality of the sleep you get?																
I wake up usually/most days feeling refreshed (%)	68	61	61	59	50	53	60	54	68	63	63	58	54	55	52	50	58
I wake up tired often/fairly often (%)	32	39	39	41	50	47	40	46	32	37	37	42	46	45	48	50	42

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Depression

Table 8 summarizes results relating to depression. Respondents were asked: “Over the past two weeks, how often have you been feeling down, depressed or hopeless?” The types who reported depression more frequently than the overall average were two temperament groups: Idealists and Experiencers. This is consistent with type theory [12] which recognizes that different types may exhibit similar behavior, but for different reasons. Idealists tend to be extremely sensitive and introspective. Innately empathetic, they can experience intense disappointment when things don’t happen the way their deeply held values dictate that they should. Experiencers can easily have their feelings hurt and be disappointed. Also, they don’t naturally seek to understand why certain circumstances might cause them to feel down or depressed.

ESTPs and ISTPs - as Sensing-Thinkers (STs) - may be less likely to understand, acknowledge and express their emotions and feelings. And if they do express their feelings – especially negative ones – it may make them feel uncomfortable and vulnerable. As a result, fears and concerns may be suppressed and manifest in depression [12].

The types least frequently reporting symptoms associated with depression are ESTJ, ISTJ, INTJ and ENTP. All four are the cool, logical and objective Thinkers (T), who tend not to worry in general, and especially don’t “sweat the small stuff”. Three were Judgers (J), and more importantly, three were tough-minded and pragmatic Thinking-Judgers (TJs). Also among the types least prone to depression were two Conceptualizers (ENTP and INTJ) who process information objectively and intellectually, rather than through their emotions. Also not prone to depression are the two realistic and concrete Traditionalists (ESTJ and ISTJ) types who are less aware of and trusting of emotions and feelings.

Another symptom associated with depression is how much or little pleasure a person reports experiencing. Respondents were asked: “Over the past two weeks, how often have you had little interest or pleasure in doing things?” Two Idealist types (ENFP and INFP) reported this more frequently than the overall average. Experiencers’ responses to the question that asked about how much or little pleasure they experience, closely mirrored the question about how often they experienced depression, with three of the four Experiencers (ESTP, ISTP and ISFP) more frequently than the overall average to report having had little interest or pleasure in doing things over the last two weeks.

Table 8: Prevalence of Depression-related Stress by Temperament and Personality Style (N=10,500)

Depression-related States	Traditionalists – SJ <i>n = 1367</i>				Experiencers – SP <i>n = 1200</i>				Conceptualizers – NT <i>n = 4726</i>				Idealists –NF <i>n = 3207</i>				10500 O V E R , L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	
	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	
	T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F	
	J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P	
	Over the <u>last 2 weeks</u> , how often have you been feeling down, depressed, or hopeless?																
Not at all (%)	70	70	62	63	57	62	58	57	63	68	67	58	60	57	52	46	62
Several days (%)	18	20	24	23	28	22	26	27	22	20	17	24	25	26	32	30	23
More than half the days/ Nearly every day (%)	12	10	14	14	15	16	16	16	15	12	16	18	15	17	16	24	15
	Over the <u>last 2 weeks</u> , how often have you had little interest or pleasure in doing things?																
Not at all (%)	70	68	62	64	54	52	62	55	63	65	65	56	62	60	53	49	61
Several days (%)	19	22	23	23	30	29	20	27	20	23	19	27	25	25	29	27	24
More than half the days/ Nearly every day (%)	11	10	15	13	16	19	18	18	17	12	16	17	13	15	18	24	15

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Anxiety

Table 9 summarizes results relating to anxiety. Respondents were asked, “Over the last two weeks, how often have you been unable to stop or control worrying?” Three of the four Idealists – INFJ, ENFP and INFP –reported this more frequently than the overall average. These findings are consistent with type theory [12]. With their rich imaginations and an inability to see things realistically, it is easy for Idealists to imagine worst case scenarios, and allow themselves to be gripped by fear.

Not surprising, the three types with the least difficulty stopping or controlling worrying were ESTJs, ISTJs and INTJs. All three are the cool, logical and objective Thinkers (T), who tend not to worry in general, and especially don’t “sweat the small stuff”. These three are also Judgers (J), who prefer closure to keeping things open-ended, and more importantly, they are all tough-minded and pragmatic Thinking-Judgers (TJs).

Respondents were also asked “Over the last two weeks, how often have you been feeling nervous, anxious, or on edge?” All four Idealists – ENFJ, INFJ, ENFJ and INFP – were among the types to report this more frequently than the overall average. The same innate qualities that predispose Idealists to have difficulty controlling their worrying may be responsible for their being nervous, anxious or on edge.

Two Experiencer types – ESFPs and ESTPs – also more frequently reported anxiety-related symptoms. Similar to the question relating to worrying, ESFPs’ sensitivity and lack of ability to understand the underlying cause(s) of their unhappiness, may result in anxiety. ESTPs’ anxiety may be caused or exacerbated by their difficulty being in touch with their feelings and emotions and a lack of tools to navigate these unfamiliar waters [12]. The three types which reported the least amount of anxiety or nervousness are ESTJs, ISTJs and INTJs – the same logical, cool-headed, decisive types also not prone to worrying.

Table 9: Prevalence of Anxiety-related Stress by Temperament and Personality Style (N=10,500)

Anxiety-related States	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V R , L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	
	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	
	T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F	
	J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P	
Over the last 2 weeks, how often have you not been able to stop or control worrying?																	
Not at all (%)	66	69	59	60	59	63	58	59	59	65	60	62	57	54	53	47	60
Several days (%)	18	21	25	25	23	24	26	26	23	23	27	23	24	27	29	30	24
More than half the days/ Nearly every day (%)	16	10	16	15	18	13	16	15	18	12	13	15	19	19	18	23	16
Over the last 2 weeks, how often have you been feeling nervous, anxious, or on edge?																	
Not at all (%)	64	62	53	57	48	55	51	52	54	61	57	53	52	50	43	41	55
Several days (%)	23	26	31	28	34	29	28	33	29	25	25	30	28	31	35	33	29
More than half the days/ Nearly every day (%)	13	12	16	15	18	16	21	15	17	14	18	17	20	19	22	26	16

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Healthcare Professional Usage

Table 10 summarizes results relating to patients’ usage of healthcare professionals. The four types who reported that “getting an annual physical” was very important more frequently than the overall average were ESFJ, ESTJ, ESFP and ENFJ. According to personality type theory [12], all four are the more proactive and initiative-taking Extraverts (E), three of the four

are the typically disciplined Judgers (J), and three of the four are also practical, realistic Sensors (S). Also two of these four (ESFJ and ESTJ) are Traditionalists – who as their name implies, tend to be conventional and tend to follow the recommendations of authority figures such as physicians, especially with regards to established and conventional practices such as getting an annual physical.

Two types reported that getting an annual physical is “not very” or “not at all” important more frequently than the overall average – INTP and ESTP. Both are the less-conventional Perceivers (P). INTPs are the most independent of the sixteen types, and ESTPs live in the moment, tend not to worry about the future, and are less inclined to follow recommendations made by authority figures, such as physicians or the medical establishment.

Four types (INTP, INFP, ISTP and ESTP) reported that it is very important to get an annual physical exam less frequently than the overall average. All four of these types are Perceivers (P) – people who are the least likely to follow rules or conventions. Three were Introverts (I), who are less proactive, and two (ISTP and ESTP) are Experiencers - types who are the least likely of to follow healthcare providers’ recommendations.

Of the four types who reported that they “tend to avoid doctors unless it is absolutely necessary” more frequently than the overall average, all are Perceivers (P). Two of these are Experiencers (ISTP and ISFP) and the other two are the very independent INTPs and self-reliant INFPs. Not surprising, all four of these types are Introverts and Perceivers (IPs), people who tend to be laid back and not very proactive [12].

Another indication of healthcare usage pertains to under what conditions patients see their doctor. The four types who reported that they “don’t hesitate to see a doctor if I’m anxious about a health concern” more frequently than the overall average were ESTJ, ESFJ, ISFJ, and ENFJ. All four are serious, goal-driven, rule following Judgers (J) [12]. Three of the four are Feelers (F), who are sensitive and prone to worrying. And three of the four are Traditionalists (SJs), the most conservative, conventional, conscientious and compliant types [12].

Table 10: Prevalence of Healthcare Professional Usage Habits by Temperament and Personality Style (N=10,500)

Healthcare Professional Usage Habits	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V E R A L L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	
	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	
	T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F	
	J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P	
	How important do you think it is for you to get an annual physical examination?																
Very Important (%)	59	50	61	53	47	47	56	48	50	49	53	42	59	52	50	43	51
Somewhat Important (%)	31	35	31	34	33	37	36	37	39	34	32	38	31	36	42	40	35
Not very important/ Not at all important (%)	10	15	8	13	20	16	8	15	11	17	15	20	10	12	8	17	14
	Which of these statements best describes how you feel about going to see a doctor?																
I don't hesitate to see a doctor if I'm feeling anxious about a health concern (%)	46	37	44	42	34	35	40	34	39	37	41	27	44	40	40	30	38
I go to a doctor only if I feel sick (%)	30	32	34	30	33	28	31	31	33	29	30	35	30	29	32	31	31
I tend to avoid doctors unless it is absolutely necessary (%)	24	31	22	28	33	37	29	35	28	34	29	38	26	31	28	39	31

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Self-discipline

Table 11 summarizes results relating to self-discipline ratings. Five types (ESTJ, ISTJ, ENTJ, INTJ, ENFJ) reported that they are very self-disciplined (“I almost always accomplish my goals”) or pretty self-disciplined (“I usually accomplish my goals”) more frequently than the overall average. All five are goal-oriented, decisive and organized Judgers (J). Four are Thinkers (T), and more importantly Thinker-Judgers (T-J), who are extremely forceful in exerting their will. In addition, two of the four are Traditionalists (ESTJ and ISTJ), who are particularly hardworking, focused and achievement-driven [12].

Six types (ESTP, ISTP, ESFP, ISFP, ENFP, INFP) reported that they were somewhat disciplined (“I start off strong, but often give up before I reach my goal.”) or not very self-disciplined (“I usually have a hard time reaching my goals.”) more frequently than the overall average. Not surprisingly, all six are Perceivers (P), people who tend to be indecisive, less-organized and are often easily distracted. Two types in this group were Idealists (ENFP and INFP) and all four of the Experiencer types (ESTP, ISTP, ESFP and ISFP) were in this group.

Table 11: Prevalence of Self-Discipline Ratings by Temperament and Personality Style (N=10,500)

Self-Discipline Rating	Traditionalists – SJ n = 1367				Experiencers – SP n = 1200				Conceptualizers – NT n = 4726				Idealists –NF n = 3207				10500 O V R , L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E S T J	I S T J	E S F J	I S F J	E S T P	I S T P	E S F P	I S F P	E N T J	I N T J	E N F J	I N F J	E N F P	I N F P	E S F P	I S F P	
	How self-disciplined are you in terms of reaching personal goals you set for yourself, such as losing weight, getting enough exercise, etc?																
Very self-disciplined – I almost always accomplish my goals/ Pretty self-disciplined – I usually accomplish my goals (%)	72	70	64	60	53	52	46	41	78	75	63	62	66	64	51	47	62
Somewhat self-disciplined – I start off strong, but often give up before I reach my goal/ Not very self-disciplined – I usually have a hard time reaching my goals (%)	28	30	36	40	47	48	54	59	22	25	37	38	34	36	49	53	38

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Tables 12 to 14 summarize results for **objective 2** which was to explore if characteristics of personality type (using the

Preferred Communication Style Questionnaire) are associated with (1) the quality of patient-physician relationships, (2) patient-physician communication, and (3) preferred method for receiving information. The focus for the second objective was to help gain an understanding regarding how personality types are associated with how best to communicate specific strategies that would be employed to change health-risk behaviors. As results are presented, brief discussion points are provided regarding how the findings are consistent with personality type theory [12].

The Quality of Patient-Physician Relationships

Table 12 summarizes results relating to the importance of patient-physician relationships. Sixty-two percent of respondents overall reported that it is “very important for me to have a good relationship with my primary care doctor.” Six types (ESTJ, ESFJ, ISFJ, ESFP, ENFJ, ENFP) reported “very important” for this question more frequently than the overall average. Of the six types, five are Feelers (F), five are people-oriented Extraverts (E). Four of these are Extravert-Feelers (EF) - people who greatly value relationships and making personal connections [12].

Of the five types (ESTP, ISTP, ENTP, INTP, INFP) who reported “very important” to this question less frequently than the overall average, four of the five are the more logical and

objective Thinkers (T). Two types are Experiencers (ESTP and ISTP) and two are Conceptualizers (ENTP and INTP), who place a much higher value on their physician’s competence, than their personal feelings towards, or relationship with their doctor [12].

When asked “besides being competent, what is the most important quality you’d like your doctor to have”, responses were consistent with type theory [12]. “Taking the time to explain things thoroughly” was relatively more important to ISFJs and ESFPs. Both types are detail-oriented Sensors and relationship-dependent Feelers (S-F), who appreciate a thorough explanation. The two types for which “genuinely expressing care” was relatively more important were the very relationship-centered ENFPs and INFPs. Two of the three types for which “to involve them in the process” was relatively more important were Conceptualizers (INTJ and ENTP). This is consistent with personality type theory which suggests that both of these types are curious and unconventional with strong opinions, prone to do independent research and not hesitant to challenge their doctors [12]. ENTJs were the only type for which “being a patient listener” was relatively more important. ENTJs are the most assertive, verbal, take-charge of all the types. It makes sense that they would want their doctors to patiently listen to them discuss their concerns and (often strong) opinions [12].

Table 12: Prevalence of Patient-Perceived Importance of the Patient-Physician Relationship Quality by Temperament and Personality Style (N=10,500)

Patient-Perceived Importance of the Patient-Physician Relationship Quality	Traditionalists – SJ <i>n</i> = 1367				Experiencers – SP <i>n</i> = 1200				Conceptualizers – NT <i>n</i> = 4726				Idealists –NF <i>n</i> = 3207				10500 O V E R A L L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	
	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	
	T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F	
	J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P	
	How important is it for you to have a good relationship with your primary care doctor?																
Very Important (%)	66	61	69	66	58	57	70	60	61	62	56	49	70	64	66	58	62
Somewhat Important (%)	28	31	26	27	32	33	23	32	32	28	32	39	26	29	28	31	30
Not very important/ Not at all important (%)	6	8	5	7	10	10	7	8	7	10	12	12	4	7	6	11	8
	Besides being competent, what is the most important quality you’d like your doctor to have?																
Takes time to explain things thoroughly (%)	37	43	37	45	37	40	46	41	34	37	37	35	33	39	29	35	40

Genuinely expressing care for me (%)	28	25	32	28	27	28	32	31	30	27	30	30	32	29	38	34	29
Involving me in the process (%)	16	16	12	13	20	18	11	13	16	20	20	18	16	13	17	14	15
Being a patient listener (%)	16	13	17	12	14	11	10	13	19	13	10	12	17	16	15	13	14
Other; specify (%)	3	3	2	2	2	3	1	2	1	3	3	5	2	3	1	4	1

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Patient-Physician Communication

Table 13 summarizes results related to the importance of patient-physician communication. Three types reported that their primary care doctor communicated with them in the way they wanted to be communicated with more frequently than the overall average. These were ESTJs, ESFJs and ENTJs. All three are Extraverts (E) and Judgers (J) – people who are verbal, determined and generally more assertive at getting the information they need. Also, two of the three (ESTJs and ESFJs) are Traditionalists – which is the modal Temperament of primary care physicians [12]. People who share the same temperament share a similar communication style, which may be why so many Traditionalists were comfortable with the way their physician communicated with them.

Respondents were asked: “How much more effective do you think your doctor would be if he/she communicated with you in the way you want to be communicated with?” A large majority – seventy-six percent –reported that their doctor would either be “a great deal, or more effective.” Four types (ESTP, ENFJ, INFJ, and ENFP) reported this more frequently than the overall average. Three were Idealists (ENFJ, INFJ and ENFP). This is expected based on type theory [12] because Idealists place a high value on their and others’ ability to communicate effectively and having harmonious, meaningful relationships.

Table 13: Prevalence of Patient-Perceived Importance of Physician Communication Qualities by Temperament and Personality Style (N=10,500)

Physician Communication Qualities	Traditionalists – SJ <i>n</i> = 1367				Experiencers – SP <i>n</i> = 1200				Conceptualizers – NT <i>n</i> = 4726				Idealists –NF <i>n</i> = 3207				10500 O V E R A L L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	
	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	
	T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F	
	J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P	
	Does your primary care doctor communicate with you in the way you want to be communicated with?																
YES (%)	83	79	81	77	74	71	76	76	80	74	69	68	79	74	76	68	76
NO (%)	17	21	19	23	26	29	24	24	20	26	31	32	21	26	24	32	24
	How much more effective do you think your doctor would be if he or she were able to communicate with you in the way you want to be communicated with?																
A great deal more effective/ More effective (%)	76	73	77	73	80	75	76	76	79	78	79	79	83	80	82	79	76

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.

Preferred Method for Receiving Information

Table 14 summarizes results relating to whether people tend to learn and remember things better when they hear them or when they see them. A large proportion – seventy-six percent of respondents – reported that seeing things is more effective. Only twelve percent reported that hearing things is more effective, with the remaining twelve percent reporting “don’t know.” Of those reporting that they prefer to receive

information auditorily more frequently than the overall average, all four are Extraverts (E). Consistent with personality type theory, Extraverts process information “externally”, out loud. In other words, they often need to talk, in order to think. It is possible that they will get more benefit from having a conversation – hearing something – than from just reading something or being shown a picture [12].

Table 14: Prevalence of Information Delivery Preference for Patient-Perceived Learning and Memory Performance by Temperament and Personality Style (N=10,500)

Information Delivery Preference	Traditionalists – SJ <i>n = 1367</i>				Experiencers – SP <i>n = 1200</i>				Conceptualizers – NT <i>n = 4726</i>				Idealists –NF <i>n = 3207</i>				10500 O V R , L
	485	148	528	206	322	254	375	249	1396	405	2318	607	870	472	1215	650	
E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	I	
S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	N	
T	T	F	F	T	T	F	F	T	T	T	T	F	F	F	F		
J	J	J	J	P	P	P	P	J	J	P	P	J	J	P	P		
Do you tend to learn and remember things better when you <u>hear</u> them or when you <u>see</u> them?																	
See them (%)	75	76	76	77	74	76	72	77	76	78	78	77	78	78	76	72	76
Hear then (%)	16	12	12	9	16	12	16	8	16	11	13	9	14	11	13	14	12
I don't know (%)	9	12	12	14	10	12	12	15	8	11	9	14	8	11	11	14	12

- Refer to Appendix B for items used to measure each variable.
- Due to large sample sizes, chi-square p-values for all comparisons were less than 0.001.
- Cells highlighted in green are 4 or more units above the overall mean.
- Cells highlighted in red are 4 or more units below the overall mean.