

‘You Are What You Compute With:’ Relationships between Personality Traits and

Computer Operating Systems

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Abstract

The goal of this study was to determine if there is any truth behind popular media stereotypes of Mac and PC users. 40 participants were given two surveys, a short form of a Five Factor personality test and a questionnaire about computer use and habits. It was hypothesized that 1) there would be positive correlations between use of Mac computers and the “Big Five” traits of extraversion and openness, 2) there would be positive correlations between use of PC computers and the “Big Five” traits of conscientiousness and neuroticism, 3) these correlations would be strongest between the traits and identification with a computer type, and 4) these personality traits would have predictive value for preference of computer type and identification with computer type but not ownership of computer type. Results indicated that extraverted individuals do prefer to use Mac computers and that the trait of extraversion is predictive of a preference for Mac computers.

If a person were to say that most current advertising campaigns are based solely on the value of the product, that person would be lying. Crest versus Colgate, Pepsi versus Coke, MasterCard versus Visa; contemporary advertising campaigns are often based on the claim that the user of one brand is more socially savvy, more powerful or “cooler” than the user of the opposing brand. In the realm of computer software, this tactic has been seen in the advertising of Mac and PC operating systems since the 1980s (Garfield, 2006).

Consider what one (completely unbiased) reporter believes is the “greatest ad of all time.” This particular ad, premiered in 1984, featured a society that resembled Orwell’s description of a brainwashed, drone-like world in his novel, “1984.” Prior to this point in time, the market for commercial computers had been dominated by the PC operating system. After scanning over this miserable society for a few seconds, the commercial shows an attractive young woman (or at least what was attractive in the 80s) running with a sledge hammer. She hurls it at a giant screen of a talking, Big Brother-esque head, the head explodes and she has effectively freed the drones from their PC dominated world. The commercial ends with the somewhat ominous statement, “On January 24th, Apple Computer will introduce Macintosh. And you’ll see why 1984 won’t be like ‘1984’” (Apple, 1984). As summed up by the reporter, this commercial put the viewing public on notice, “You are what you compute with” (Garfield, 2006). In order to find out if the type of operating system a person uses – Mac or PC – actually has any predictive value on the personality of that person, the first thing to examine is what differences, personality and otherwise, current media research seems to see between Mac and PC users.

First, personality traits are defined as “stable characteristics that explain the consistency among how humans feel, what they think, and how they present themselves” (Pervine, Cervone, and John, 2004 as reported in Wang & Yang, 2008). One of the most well-known models of

describing personality is Costa & McCrae's "Five Factor" model. This model outlines five specific traits – openness, conscientiousness, extraversion, agreeableness and neuroticism – and claims that every person's personality is made up of varying levels of those traits ("A Five Factor Theory of Personality," 1997). Personality traits have been proven to be related to many activities; for example, a study by Wang & Yang (2008) found that personality traits influence buying behavior. Wang & Yang (2008) found specifically that people with higher levels of conscientiousness were less likely to make compulsive purchases (p 695). If personality can influence buying behavior, there is a possibility it could influence *what* is actually bought. Current advertisements certainly seem as if they are directing their marketing campaigns to specific personality types. Apple, for example, markets their products to a user who is "cool," "fun," and "outgoing" – adjectives that can be seen as parallels to the "Big Five" personality traits of extraversion and openness. According to previous research findings (Hunch INC, 2009), people who classify themselves as "Mac people" do seem to describe themselves similarly to how the commercials portray their product users. The goal of the present research is to determine if the stereotypes reflected in current advertising campaigns are actually valid and that a computer operating system is either correlated with or predictive of a person's personality traits.

Hunch INC (2009) is an experimental website designed to give people recommendations for anything from "Where should I retire?" to "Should I dump that loser?" Hunch posed the following question to about 76,000 users: "Are you a Mac person or a PC person?" Out of the subjects, 31% reported being a Mac person, 48% reported being a PC person and 21% did not classify themselves as either (Hunch INC, 2009). The rest of the questions asked participants to simply choose their preference out of two or three presented options. 39 questions like this were asked in addition to demographic information. Examples of these questions included, "How often do you throw

parties? ‘Not very frequently’, ‘Every now and then’ or ‘Frequently?’” or “You’re staying in a hotel in the US which offers a complimentary paper each morning. Would you choose: ‘USA Today,’ ‘The Wall Street Journal’ or ‘The New York Times’? These types of questions were asked in regards to three different categories, ‘Aesthetics’, ‘Media’ and ‘Personality and Interests’ (Hunch INC, 2009).

The Hunch INC findings show clear differences in the preferences of self-described “Mac people” and self-described “PC people.” Hunch came up with quite a few interesting findings but relevant to the present research is how Mac and PC people describe themselves. “Mac people” are more likely to describe themselves as “verbal,” “conceptual,” and “risk takers,” who trend towards preference options that are seen as being unique or modern. “PC people” are more likely to describe themselves as “numbers oriented”, “factual” and “steady, hard workers” who trend towards preference options that are seen as being more practical and mainstream (Hunch INC., 2009). It is interesting that these results seem to pretty accurately reflect Apple’s now famous ad series which first premiered in 2006 starring Justin Long as the young, fresh and witty “Mac” and John Hodgman as the middle-aged, mainstreamed, slightly outdated “PC” (Stevenson, 2006).

Think about another advertisement, released in 2008 by Microsoft in response to the Long versus Hodgman ads by Apple. The first spot in Microsoft’s own new ad series opens with an actor who bears an extreme resemblance to John Hodgman stating, “Hello. I’m a PC. And I’ve been made into a stereotype.” What follows is a 60-second spot featuring PC users all around the world, including Bill Gates himself, small children, an astronaut and celebrities such as Eva Longoria and Deepak Chopra (Rupal, 2008). The Hunch INC (2009) findings, however, seem to suggest that Long and Hodgman “Buy A Mac” advertisements may accurately describe the user profile of the two different operating systems. The Hunch (2009) findings are based on casual links, though.

This study can't claim that if its findings show that "you are what you compute with" (your computer determines your personality) or if it's just "what you are plays a role in determining what you compute with."

The current study examines certain personality traits out of the "Big Five" (extraversion, openness, neuroticism, conscientiousness and agreeableness) to see if they have any predictive value on or if they are correlated with use of a specific operating system. This study is an exploratory study which takes the aforementioned information, culled from popular culture and media sources, and applies to it a psychological lens. Little psychologically based research on the topic of personality differences between types of computer users has been completed. Of the few studies that have been run, most have either been completed in the 1980s or early 1990s and now may be out of date. Sigurdsson's 1991 study reports that subjects who have more knowledge and practice with using computers appear to be more introverted and more efficacious – a trait which seems to relate more to conscientiousness and neuroticism than to openness (p 623). According to the popular media advertisements, Macs are much simpler to use and require less practice than PCs. One of the commercials starring Long and Hodgman has the two sitting in boxes, discussing what they need to do in order to be user-ready. While Hodgman lists a slew of complicated sounding procedures he has to perform, Long simply states, "Oh, I do it all right out of the box" (Apple, 2006). Perhaps PC users will have more introverted personalities. A more recent study completed by McClure & Nylund (2006) focuses on the relationship between personality and video game use but generates hypotheses that can be related to computer use as well. Extraverts need more stimulation to become aroused and, consequently, seek out more excitement; they need more active involvement and stimulation than introverts (McClure & Nylund, 2006, p 15). People who are extraverted were found to play stimulating computer games more frequently than introverts

(McClure & Mears, 1986 are cited in McClure & Nylund, 2006, p. 15). According to the popular media advertisements, Macs are much more exciting and have more features than PCs so perhaps Mac users have more extraverted personalities.

Based on the media stereotypes and previous research findings, we predict that 1) Mac users will score higher in the traits of extraversion and openness as assessed by the Ten Item Personality Inventory and 2) PC users will score higher in the traits of conscientious and neuroticism (Hunch INC, 2009). Participants were asked not just, “What type of computer would you classify yourself as?” but also “What type of computer do you use most frequently?” and “What type of computer do you prefer?” Asking each of those three questions is perhaps the key difference between the present study and past research. Past research has only correlated participants’ traits or preferences with their answer to one of those three questions but there is, in fact, a difference between those questions and how a subject answers them (Marchesani, 1992; Hunch INC, 2009). Therefore, we also predict that 3) these correlations (Macs being more extraverted and open and PCs being more conscientious and neurotic) will be strongest between traits and identification (classification) with a computer system, and 4) personality traits will have predictive value for preference of computer type and identification (classification) with computer type but not ownership of computer type.

Methods

Participants

Psychology undergraduate students (8 men, 32 women, $M_{\text{age}} = 20.75$ years, age range: 18 - 22 years) enrolled in either a Research Methods or Advanced Lab course were recruited by a researcher coming in and making announcements in their classroom. An explanation about what

participation in the present research would entail was given and then sign-up sheets were passed among the students. Since this study examines the possible personality differences between types of computer operating systems owned, preferred and identified with, it is relevant to note that 57.5% of participants owned PCs while 42.5% owned Macs.

Materials

Participants were given two different surveys – one about their use and attitudes towards computers and the “Ten Item Personality Inventory” (TIPI), a short form of the “Five Factor” personality scale which was modified slightly for the purposes of this study.

The TIPI lists ten sets of different pairs of adjectives (ie. extraverted, enthusiastic; anxious, easily upset) and instructs subjects to indicate the extent to which they agree or disagree that *both* of the adjectives describe them. The TIPI measures the degree to which the subject exemplifies each one of the “Big Five” traits (extraversion, agreeableness, conscientiousness, neuroticism and openness to new experiences). The original version of the TIPI utilizes a 7 point Likert scale with 1 meaning “disagree strongly,” 7 meaning “agree strongly” and 4 meaning “neither agree nor disagree.” The modified version for the present study uses a 6 point Likert scale with the same meaning for 1, 6 meaning “agree strongly” and no available option for “neither agree or disagree.”

To assess their computer usage habits, subjects filled out a short survey that had been assembled for the purposes of the present research. Certain questions were borrowed from Marchesini’s “Compute Information Sheet” (1992, pp 50 - 51) while others were generated by the current researchers. First, participants were asked for how many years and for how many hours a day did they used Macs and PCs. The next questions were answered using a Likert scale with response options ranging from 1 = “disagree strongly” to 6 = “agree strongly.” These questions asked participants about their degree of experience and satisfaction with Macs and PCs. They also

asked to what extent did certain environmental factors influence their preference of computer (ie. place of employment, family, professional reviews, commercials). Open-ended questions followed, the goals of these questions were to clarify answers to some of the questions that had been answered using the Likert scale. The open-ended questions essentially asked participants to explain their reasoning for what type of computer they preferred. For example, one of the open-ended questions asked, "Why do you prefer your preferred type of computer?" Other open-ended questions included, "What type of computer do you own?", "What type of computer do you prefer using?" and "What type of computer would you classify yourself as?" Finally, demographic information (age, sex, field of study, political affiliation and family income bracket) was requested. Copies of the modified version of the TIPI and our "Computer Information Survey" are included in the Appendix.

Procedure

After signing a consent form, participants over the age of 18 were handed a copy of each of the surveys. They were told, "Please fill out both of these surveys. It doesn't matter the order in which you complete them. Don't hesitate to ask us if you have any questions or need clarification about a particular question." After completing the surveys, participants put them face down on a desk or table so the researchers had no chance to see which participant had which coding number on top of their survey. The pile of surveys was only collected by the researchers after all the participants had left. After placing their completed survey on the desk or table, the participant was thanked for their participation, handed a debriefing form and told verbally to "please contact us know if you have any questions or want to find out the results."

Results

Out of the 40 subjects, 57.5% owned PCs while 42.5% owned Macs. However, 47.5% of participants preferred to use PCs while 50% of participants classified themselves as “PC people” (refer to Table 2). These differing percentages suggest that subjects do not necessarily agree that the computer they own, prefer to use, and identify with is one in the same. From this finding, it was realized that ownership, preference and classification do, in fact, need to be compared separately with each of the five personality traits.

First, correlations were run to determine to what extent relationships existed between the reported levels of each of the five personality traits, type of computer owned, type of computer preferred, and type of computer they classified themselves as (see Table 1). While it is true that type of computer owned, preferred, and classified were strongly, positively related to each other the relationships were not perfect (see Table 1). This was reflected in the finding that one personality trait was moderately, positively correlated with only computer preference – not ownership or identification. Subjects who had higher extraversion levels according the TIPI reported preferring Mac computers ($r = .31, p = .05$). It was also found that the trait of extraversion was moderately significantly correlated with openness ($r = .50, p = .01$) so, albeit not directly, Macs were also associated with the trait of openness. Hypothesis 1 predicted Mac users would score higher in the traits of extraversion and openness, results partially supported this. No evidence supporting Hypothesis 2, which stated PC users would score higher in the traits of neuroticism and conscientiousness, was found. Results did not support Hypothesis 3, that correlations would be strongest between personality traits and the type of computer a participant would say classifies themselves. Significant correlations were only found between extraversion and preference of computer. However, the correlation between extraversion and type of computer a participant

classified themselves as was almost significant ($r = .30$, $p = .08$) and, perhaps with more participants, could have been.

Hypothesis 4, that traits would be predictive of what type of computer subjects prefer and classify themselves as but not necessarily what type of computer they own, was partially supported. Three separate regression analyses were conducted to determine if there was any predictive value for each separate trait on type of computer owned, type of computer preferred and type of computer a participant identified with. Analysis found that the trait of extraversion was a significant predictor of preference for Mac computers, $Beta = .45$, $t = 2.30$, $p = .03$. The regression findings coincided with the correlation findings in that no other traits were significant predictors of computer ownership, preference or identification. Also, as found in the correlations, extraversion was not a significant predictor of computer ownership or identification ($Beta = .24$, $t = 1.21$, $p = .25$ and $Beta = .26$, $t = 1.27$, $p = .22$ respectively).

Discussion

Even though the present study's hypotheses were not supported in full, the results found still have implications in the realms of advertising and personal use. Results showed that only one personality trait, extraversion, was correlated with preference for Mac computers and was even predictive of this preference. The correlation between extraversion and type of computer a participant identified with was almost significant and, perhaps with more participants, could have been so.

It is interesting that that the only significant correlation and prediction between a trait and type of computer was that between extraversion and preference for Mac computers. This leads us to believe that it is the actual design structure of and what it takes to physically operate the

computer that is related to the trait of extraversion. The question then arises, “What is structurally different about Mac computers that could be related to extraversion?” This might be answered by one of the previously mentioned research studies. Extraverts need more stimulation to become aroused and, consequently, seek out more excitement (McClure & Nylund, 2006, p 15). According to the popular media advertisements, Macs are much more exciting and have more features than PCs. Since extraverts typically have a higher threshold for stimulation and actually seek out that stimulation, it makes sense they would prefer the type of computer that has more bells and whistles to it. Whether or not Macs actually are a more stimulating computer than PCs almost doesn’t matter. It only matters that advertisements tell the public Macs are more the stimulating computer and the public will believe the statement regardless of its verity.

None of the other personality traits were even remotely correlated with or predictive of ownership, preference, or identification with one certain operating system. The trait of openness was, at least, significantly moderately correlated with the trait of extraversion. So, since extraversion was correlated with and predictive of preference for Mac computers, openness was related to Mac computers as well – just not directly. In order to figure out why the rest of the “Big Five” traits did not seem to be at all related to computer operating system, it is necessary to look at each of those traits separately. People who have high levels of conscientiousness are characterized by their self-discipline, dutiful actions and aim to achieve (“A Five Factor Theory of Personality,” 1997). For truly conscientious people, the type of computer they use may not matter because their high aim to achieve is likely be the driving force in their life. The trait of neuroticism is actually classified by emotional instability and strong negative reactions to mild stimuli (“A Five Factor Theory of Personality,” 1997). However, the term “neurotic” is used colloquially to describe a person who is a perfectionist or “anal retentive.” This colloquial description sounds quite a bit like

the trait of conscientiousness. There were no specific predictions made about the trait of agreeableness and ownership of, preference for, or identification with one certain operating system because we did not expect to find any significant relationships. Someone displaying the trait of agreeableness could be described as cooperative and compassionate (“A Five Factor Theory of Personality,” 1997). For a truly agreeable person, similar to the truly conscientious person, the type of computer probably does not have much influence in their daily life since their cooperative nature should allow them to get along with all types of computers.

Possible benefits for this study can be seen in the realm of marketing and in home use. Since it appears as though extraverts prefer Mac computers, advertisements for Macs could also include many exciting stimuli to attract the attention of those extraverts and make them want to buy the computer. Advertisements like the ones using Long and Hodgman may not be the most effective for Apple because those ads feature two men standing against a white background. While flipping the channels, an extravert is likely to just skip right by that commercial without watching it because it involves nothing particularly eye-catching or interesting. In the realm of home use, the present results could mean that Mac computers are more intuitive and compatible with the trait of extraversion. It is possible that knowing and using which operating system fits a person’s trait best could maximize that person’s work output. So, if a person is extraverted, they actually may get more work done more quickly if they use a Mac computer.

Our initial concern with this study was that subjects would be so aware of the stereotypes of Mac and PC users from everyday media that participant expectancies and reactions would occur. We were afraid participants would consciously or subconsciously try to fulfill or go against the stereotypes they thought we were looking for. In fact, after they had completed the study and read our hypothesis in our debriefing, many participants commented to the researchers how they knew

those stereotypes had to exist because they fit into those stereotypes so well. Since it wasn't the case that many strong correlations existed or no correlations at all existed, our fears about participant expectancies and reactions did not seem to be founded.

Future replications of this study will definitely want to use a larger, more varied sample. The current sample was very homogenous, utilizing only college students who were all Psychology majors and in the same socioeconomic class. A correlation between extraversion and type of computer identified with was found to be close to significant and could perhaps have been significant with a larger, more varied sample. In addition, a different measure of personality may want to be used. The Ten Item Personality Inventory utilized in this study is extremely short and, therefore, not very comprehensive. In addition, it is very easy to figure out what the TIPI assesses by simply reading the questions. This problem could only have been enhanced by the fact that the current study utilized on Psychology majors, likely to be familiar with the TIPI and Five Factor theory. Stronger, more accurate assessments of trait levels could be made with a longer, less transparent inventory. The current study concludes that relationships between personality and computer preference do exist. In the future, the strength and factors that create these relationships may be found.

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Tables

Table 1

Correlations Between Traits and Computer Habits

	1	2	3	4	5	6	7	8
1. Prefer	--	.81**	.79**	.31*	.05	-.10	.04	.02
2. Own		--	.79**	.26	.16	.10	.20	.16
3. Classify			--	.30	.15	.11	.20	.06
4. Extravert				--	.500**	.06	.20	-.09
5. Open					--	-.20	-.03	.16
6. Conscientious						--	.33*	.06
7. Agreeable							--	-.02
8. Neurotic								--

Note: ** Correlation is significant at the .01 level; * Correlation is significant at the .05 level
 For the purposes of coding, PCs were listed as "1" and Macs were listed as "2."

Table 2

Frequencies of Computer Preference, Classification and Possession

	Prefer	Classify	Own
PC	47.5%	50.0%	57.5%
Mac	50.0%	42.5%	42.5%
No Response	2.5%	7.5%	--

Note: N = 40

Appendix

Ten-Item Personality Inventory – (TIPI)

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree A Little	Agree A Little	Agree Moderately	Agree Strongly

I see myself as:

1. _____ Extraverted, enthusiastic
2. _____ Critical, quarrelsome
3. _____ Dependable, self – disciplined.
4. _____ Anxious, easily upset.
5. _____ Open to new experiences.
6. _____ Reserved, quiet.
7. _____ Sympathetic, warm.
8. _____ Disorganized, careless.
9. _____ Calm, emotionally stable.
10. _____ Conventional, uncreative.

Computer Information Survey

Please answer the following questions and put your response on the space provided.

1. How many years have you worked with PC computers? _____
2. How many years have you worked with Mac computers? _____
3. How many hours a day do you use a PC? _____
4. How many hours a day do you use a Mac? _____
5. What type of computer do you own? _____

Please circle your level of experience and satisfaction with the following aspects of computer usage.

6. Experience with Windows

1	2	3	4	5	6
Disagree	Disagree	Disagree	Agree	Agree	Agree
Strongly	Moderately	A Little	A Little	Moderately	Strongly

7. Satisfaction with Windows

1	2	3	4	5	6
Disagree	Disagree	Disagree	Agree	Agree	Agree
Strongly	Moderately	A Little	A Little	Moderately	Strongly

8. Experience with Macintosh

1	2	3	4	5	6
Disagree	Disagree	Disagree	Agree	Agree	Agree
Strongly	Moderately	A Little	A Little	Moderately	Strongly

9. Satisfaction with Macintosh

1	2	3	4	5	6
Disagree	Disagree	Disagree	Agree	Agree	Agree
Strongly	Moderately	A Little	A Little	Moderately	Strongly

10. Do you prefer using PC or Mac computers?

11. Why do you prefer this type of computer?

12. To what degree did each of the following influence your preference for this type of computer?

a. Place of employment

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

b. Friend or Family

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

c. Commercials, ads, or salespeople

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

d. Professional reviews, scholarly articles

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

e. Only choice available

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

d. Compatibility with other environments (ie work or school)

1	2	3	4	5
Not at all	A Little	Some	Quite a bit	Completely

e. Other (please describe)

13. If you could buy any type of computer you wanted, all limitations aside, what would it be and why?

14. Would you classify yourself as a Mac or PC person? Why?

15. What is your major and minor (if applicable)?

16. What is your gender? _____

17. How old are you? _____

18. What is your political affiliation, if applicable? (Republican, Democrat, Independent, etc.)

19. What is your family's income bracket? Try for your best estimate, but if you have no idea, please circle "unknown." All numbers are given for a per year basis. Remember, all your answers are anonymous.

- a. \$34,999 or less
- b. \$35,000 - \$74,999
- c. \$75,000 - \$149,999
- d. \$150,000 – 199,999
- e. \$200,000 or more
- f. unknown