PSYCHOLOGY, MEDICINE, AND ROBOTICS

ONLINE SOCIAL NETWORKS AND PEOPLE'S PSYCHOLOGY

SURF Conference Panel Session 3B

By: Hai Hoang
Mentor: Dr. Kaiping Peng, Psychology

I. Background

Hundreds of millions of people use online social networks (OSN) daily.[1] People use OSN to communicate and expand their online personal network. Experts have argued that people use OSN to meet various social needs such as self-expression or self-esteem enhancement.[2] In addition, Granovetter argued that in a given social network, there are strong ties (friends who share personal connection), and weak ties (acquaintances with rather distant relationships).[3, 4] Combining the ideas of OSN, self-presentation, and tie strength, Wilcox and Stephen argued that "because people care about the image they present to close friends on social networks, social network use enhances self-esteem in users who are focused on close friends (i.e., strong ties) while browsing their social network."[5] In their study, they successfully demonstrated that people with strong ties actually have higher self-esteem momentarily compared to those with weak ties.[6] Moreover, previous research indicated that greater self-esteem could lead to more indulgent choices.[7] Thus, Wilcox and Stephen proposed that "enhanced self-esteem from browsing a social network will momentarily lower self-control," and the decrease in control was clearly demonstrated in unhealthy food choice, decreased task persistence, lower credit score, and binge eating.[8] In short,

1 Wilcox Keith, and Stephen Andrew T. "Are Close Friends the Enemy? Online Social Networks, Self-Esteem, and Self-Control," *Journal of Consumer Research* 12, no. 57 (2012): 90 - 103.

2 Back Mitja D., Juliane Stopfer M., Simine Vazire., Sam Gaddis., Stefan Schmukle C., Boris Egloff., and Samuel Gosling D. "Facebook Profiles Reflect Actual Personality, Not Self-Idealization," *Psychological Science* (2010): 372-74.

3 Granovetter, Mark S. "The Strength of Weak Ties," *American Journal of Sociology* (1973): 1360-80.

4 Ryu Gangseog, and Lawrence Feick. "A Penny for Your Thoughts: Referral Reward Programs and Referral Likelihood," *Journal of Marketing (2007)*: 84-94.

5 Wilcox Keith, and Stephen Andrew T., 90.

6 Wilcox Keith, and Stephen Andrew T., 90.

7 Wilcox Keith, Thomas Kramer, and Sankar Sen. "Indulgence or Self-Control: A Dual Process Model of the Effect of Incidental Pride on Indulgent Choice," *Journal of* Consumer Research (2012): 151-63.

8 Wilcox Keith, and Stephen Andrew T., 90.

Wilcox and Stephen successfully demonstrated that for people who were reminded of their strong ties, Facebook browsing enhanced their self-esteem, which lowered their self-control.[9]

This current study attempts to replicate and extend those findings. Specifically, I hypothesized that there would be an increase in self-esteem and decrease in self-control after Facebook use for people who were reminded of their close friends. In addition, if there was a connection between Facebook usage frequency and credit score (the higher the frequency, the lower the credit score), then perhaps Facebook usage would affect people's online purchase intention as well.[10] Considering the results of the above study, I hypothesized that if self-control decreased, online purchase-intention increased.

In a different yet relevant line of research, Asian culture is considered to be interdependent while American culture is considered to be independent.[11] Because Asian culture emphasizes social connection, I hypothesized that Asians would show a stronger effect of strong ties compared to Whites, which leads to the stronger purchase-intention.

The Big 5 Personality traits are a well-established and thoroughly researched idea in psychology. Researchers have come to agree that adults' personality characteristics can be organized into five broad trait domains.[12] It is the opinion of this paper that self-control and conscientiousness are related by definition. Self-control is defined as the ability to "suppress prepotent responses in the service of a higher goal."[13] ("Prepotent" means "greater than others in power or influence.")[14] Conscientiousness is defined as "socially prescribed impulse control that facilitates task- and goal-directed behavior, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks."[15] Due to their similarities, I hypothesized that if self-control decreases, then conscientiousness should also decrease. Put differently, I hypothesized that people who were reminded of their close friends would have lower conscientiousness momentarily after Facebook.

II. Methods

Participants were 156 people (102 female, 52 male, and 2 declined to state) who were recruited through an online pool of participant from a business lab. Since the study focused on the influence of online social network (OSN), only people who had an active Facebook account were eligible to participate in this study. Eligible participants would be entered into a drawing for two $100 Amazon gift cards. Of these people, 47 were White, 11 were African American, 1 was Hispanic/Latino, 91 were Asian/Pacific Islander and 4 were mixed. The average age was 25.

9 Wilcox Keith, and Stephen Andrew T., 90.

10 Wilcox Keith, and Stephen Andrew T., 99.

11 Markus Hazel R., and Kitayama Shinobu. "Culture and the self: Implications for cognition, emotion, and motivation," *Psychological Review* (1991): 224–253.

12 Soto Christopher J., and John Oliver P. "Using California Psychological Inventory to assess the Big Five personality domains: A hierarchical approach," *Journal of Research in Personality* 43 (2009): 25-38.

13 Duckworth, Angela L., and Seligman Martin E. P. "Self-Discipline gives girls the edge: Gender in self-discipline, grades, and achievement test scores," *Journal of Educational Psychology* 98 (2006): 198-208.

14 "Oxford Dictionary," accessed Nov 16th, 2013, http://www.oxforddictionaries.com/us/definition/american_english/prepotent

15 John Oliver P., and Srivastava Sanjay. "The Big Five trait taxonomy: History, measurement, and theoretical perspective," in *Handbook of personality: Theory and research,* ed. L. A. Pervin and O. P. John, 2nd edition (New York, NY: Guilford Press, 1999): 102-139.

III. Measures

The current study used self-esteem scale,[16] self-control scale,[17] Big 5 inventory,[18] and purchase intention scale.[19] Because there was no current purchase intention scale in the literature, I developed the 16-item scale to address people's buying intention based on the most sold items on the internet in 2012[20] (see Appendix 1 and 2).

IV. Procedure

I created a survey using Qualtrics, an online survey generator often used by social scientists in order to design studies and gather data. Participants were given a link to the survey and were asked to complete the survey in one sitting.

After signing the consent form, the participants answered general questions about their internet and Facebook usage. Next, participants completed the Rosenberg self-esteem scale, the self-control scale, and a full version of the Big 5 inventory. Then, they were given a name-listing task (which serves as a tie-strength manipulation) consisting of three conditions. People in the strong tie condition were asked to list the names of five friends on Facebook who they consider to be close friends. Those in weak tie condition were asked to list the names of five friends on Facebook who they consider to be distant friends. The last condition was the control condition where participants were asked to re-type the following strange names: "Evren, Yalvac, Matua, Ye-va, Koch." Next, all participants logged-in to their personal Facebook profiles for five minutes. Participants were instructed to read the newsfeed or look at the profile of themselves or of their friends only. They were reminded not to make any change or interaction (i.e. chat, share, comment, update status, upload photos, or edit profile). Doing so allowed a clean comparison to the control group and avoided potential confounding variables; people's psychology may change dramatically if they interact with their friends. After the website task, participants addressed their buying intention on a 7-point Likert scale (from "Very Unlikely" to "Very Likely"). Finally, they completed three scales again (self-esteem, self-control, and Big 5) before completing a demographic form.

V. Results

There were 45 people in the close-friends condition, 52 in the distant-friends condition, and 47 in the control condition. The dependent variables were the difference in self-esteem, self-

16 Rosenberg Morris. "Society and the adolescent self-image" (Princeton, NJ: Princeton University Press, 1965).

17 Tangney J. P., Baumeister R.F., and Boone, A.L. "High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success," *Journal of Personality* (2004): 271-324.

18 John O. P., Donahue E. M., and Kentle R. L. (1991). The Big Five Inventory—Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.; John, O. P., Naumann, L. P., and Soto, C. J. "Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues," in *Handbook of personality: Theory and research*, ed. O. P. John, R. W. Robins, and L. A. Pervin (New York, NY: Guilford Press, 2008): 114-158.

19 Hoang Hai. "Purchase Intention Scale" (2013).

20 "Top Selling Internet Items," accessed November 6th, 2013, http://www.statisticbrain.com/top-selling-internet-items/

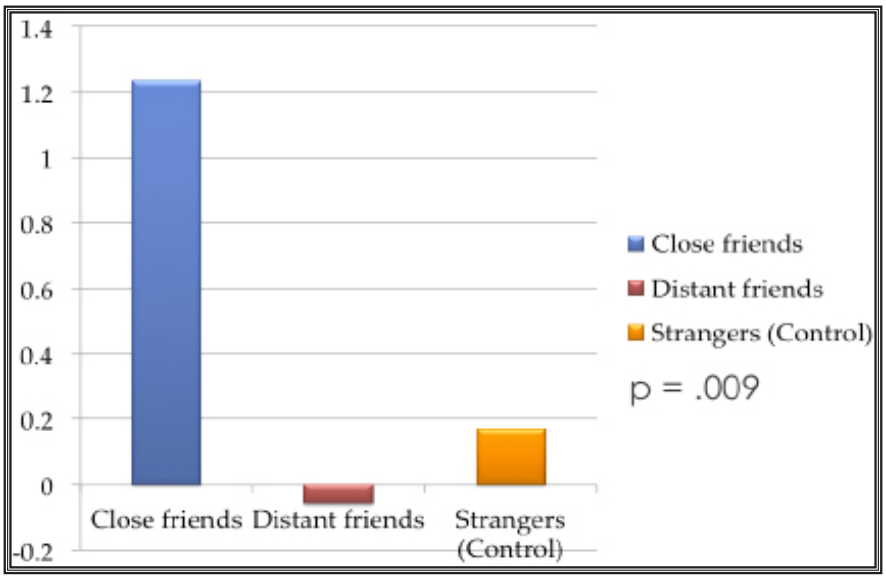
control, conscientiousness (before and after the manipulation), and purchase intention score. For example, to see the increase in self-esteem, we calculated *self-esteem difference* using the formula: self-esteem score (after Facebook) minus self-esteem score (before Facebook).

A. Hypothesis 1

There would be an increase in self-esteem and decrease in self-control after browsing Facebook for people who were reminded of their close friends.

The one-way ANOVA showed that there was a significant effect of tie strength on the three groups at $p < .05$ level: F (2,152) = 4.806, p = .009 (see Table 1a). Post-hoc analysis comparisons using Scheffe test indicated that the close-friend group (M = 1.23, SD = 2.44) was significantly different from the distant-group (M = -.04, SD = 1.81) and the control group (M = .13, SD = 2.35) (see Table 1b). Put differently, there was a significant effect of tie strength: those who were reminded of their close friends had a significant increase in self-esteem (see Graph 1).

On the other hand, people's self-control did not change significantly after Facebook (see Table 2).

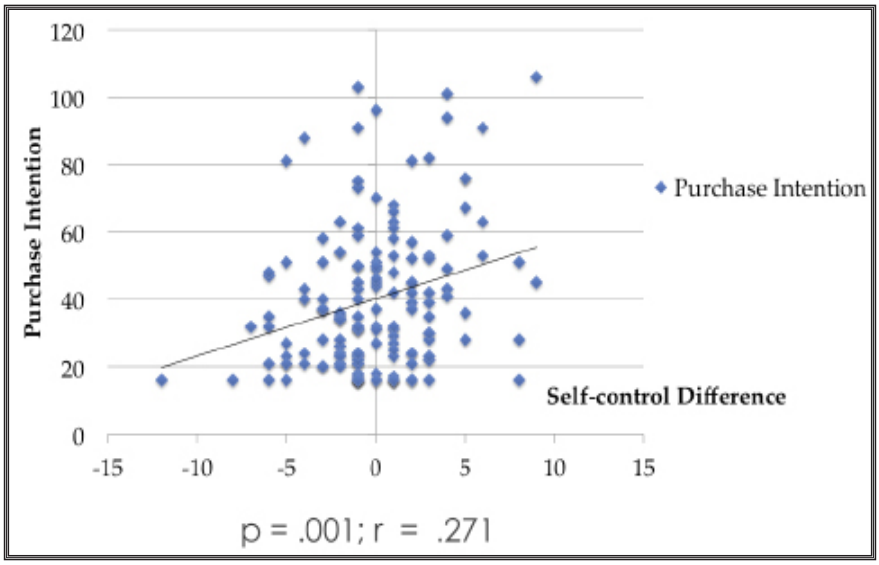


Graph 1. Difference in Self-esteem

B. Hypothesis 2

People who were reminded of their close friends would have a higher purchase intention compared to the other groups.

The one-way ANOVA showed that there was no significant effect of tie-strength on purchase intention (see Table 3). Nonetheless, there was a highly significant correlation between self-control difference and purchase intention: r = .27, p = .001 (see Graph 2 and Table 4).

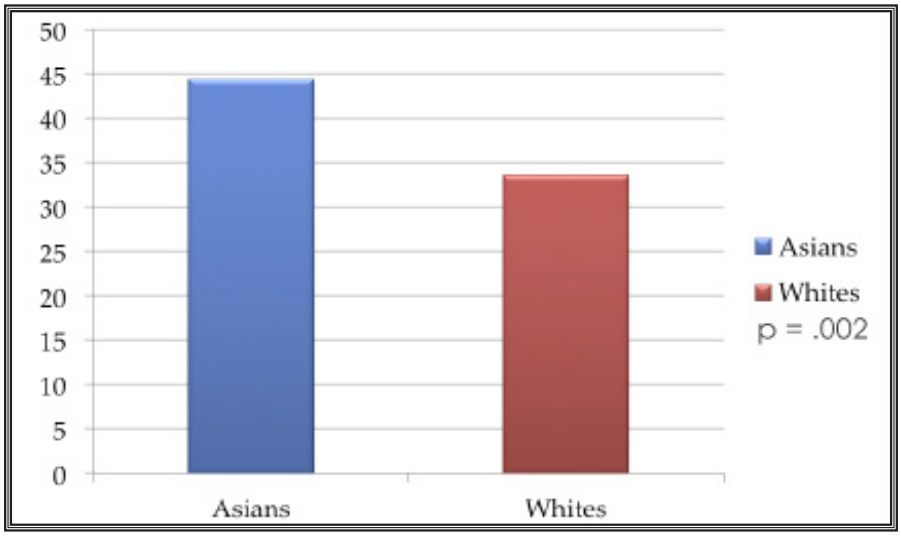


Graph 2. Correlation between Purchase Intention and Self-control difference

C. *Hypothesis 3*

Asians would have higher purchase-intention compared to Whites.

The one-way ANOVA indicated that there was a highly significant difference between Asians and Whites in terms of their purchase-intention: $F\ (1,136) = 7.819$, $p = .006$. Specifically, Asians had higher purchase intention (M = 44.37, SD = 22.86) than Whites did (M = 33.66, SD = 17.96) (see Graph 3 and Table 5).



Graph 3. Purchase Intention score between Asians and Whites

D. Hypothesis 4

People who were reminded of their close friends would have lower conscientiousness after Facebook compared to those in other conditions.

The one-way ANOVA showed no significance difference in conscientiousness across all three conditions (see Table 6).

VI. Discussion

The study has demonstrated some significant findings. First, people who were reminded of their close friends showed an increase in self-esteem after Facebook usage. Second, there was a self-control difference that significantly correlated with purchase intention. Third, Asians had higher purchase intention than Whites did. On the other hand, the study was unable to find the influence of tie strength on purchase intention. One explanation may be due to the purchase intention scale, which was developed by the author, and thus has not been validated by other studies. Considering that this is the first attempt to measure people's intention to buy online products, future studies need to take a step further by developing a better scale that more accurately represents the intention to buy.

In addition, participants did not show a difference in conscientiousness before and after Facebook, and self-control did not significantly change before and after the manipulation. This finding is somewhat consistent with the earlier finding by Wilcox and Stephen.[21] However, because Wilcox and Stephen limited "self-control" as "unhealthy food choice," the current study demonstrates a more accurate measure because it came up with the same conclusion using two different scales: self-control and conscientiousness.[22]

Perhaps one striking implication of this study is the dramatic increase in self-esteem after using Facebook for only 5 minutes. It would be interesting to see whether there is an effect as a result of a longer exposure to online social network. In addition, future studies should identify where the effect plateaus, and at which point it decreases, if at all. Moreover, the fact that Asian participants bought more than White participants did is also consistent with the current trend in the world in 2012: Asians topped the global e-commerce, followed by the global average, Latin America, Europe, North America, and Middle East/Africa.[23] The study originally hoped to explain the underlying psychological mechanism behind this trend. However, more studies are needed to fully explain this phenomenon from a psychological perspective.

No study is perfect, and this current research is no exception. One limitation is that the study restricted the participants to only "observe" what was happening on their Facebook. Different tasks on Facebook may result in distinct psychological outcomes. Future studies may want to explore the effects of assigning different Facebook tasks on various psychological outcomes like self-esteem, self-control, conscientiousness and especially purchase intention.

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21 Wilcox Keith, and Stephen Andrew T., 90.

22 Wilcox Keith, and Stephen Andrew T., 95.

23 "How Digital Influences How We Shop Around the World," Nielsen Holdings N.V., accessed Nov 16, 2013, http://fi.nielsen.com/site/documents/NielsenGlobalDigitalShoppingReportAugust2012.pdf

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Figures

Descriptives

					95% Confidence for Mean			
	N	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Minumum**	**Maximum**
Strong	47	1.2340	2.44249	.35627	.5169	1.9512	-4.00	10.00
Weak	54	-.0370	1.81152	.24652	-.5315	.4574	-6.00	4.00
Control	54	.1296	2.35561	.32056	-.5133	.7726	-9.00	6.00
Total	155	.4065	2.26405	.18185	.0472	.7657	-9.00	10.00

ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	46.949	2	23.475	4.806	.009**
Within Groups	742.444	152	4.885		
Total	789.394	154			

Table 1a. Self-esteem difference among three condiions
SE_DIFF = Self-esteem diference (Time2 - Time1)
Strong = strong tie (close friends)
Weak = weak tie (distant friends)
Control = control
**p< .01

Post Hoc Tests

Multiple Comparisons

					95% Confidence Interval	
(I) TIE	**(J) TIE**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**Lower Bound**	**Upper Bound**
Strong	Weak	1.27108*	.44088	.017	.1812	2.3610
	Control	1.10441	.44088	.046	.0145	2.1943
Weak	Strong	-1.27108*	.44088	.017	-2.3610	-.1812
	Control	-.16667	.42533	.926	-1.2181	.8848
Control	Strong	-1.10441*	.44088	.046	-2.1943	-.0145
	Weak	.16667	.42533	.926	-.8848	1.2181

* The mean difference is significant at the 0.05 level

Table 1b. Post Hoc test for Self-esteem difference among three conditions
SE_DIFF = Self-control difference (Time2-Time1)
Strong = strong tie (close friends)
Weak = weak tie (distant friends)
Control = control
*p < .05

Descriptives

					95% Confidence for Mean			
	N	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Minumum**	**Maximum**
Strong	47	.0213	3.78492	.55209	-1.0900	1.1326	-9.00	12.00
Weak	54	.4630	2.96974	.40413	-.3476	1.2735	-9.00	8.00
Control	54	-.2222	3.44590	.46893	-1.1628	.7183	-8.00	6.00
Total	155	.0903	3.38900	.27221	-.4474	.6281	-9.00	12.00

ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	12.998	2	6.499	.563	.571
Within Groups	1755.738	152	11.551		
Total	1768.735	154			

Table 2. Self-esteem difference among three condiions

SE_DIFF = Self-esteem diference (Time2 - Time1)
Strong = strong tie (close friends)
Weak = weak tie (distant friends)
Control = control

Descriptives

					95% Confidence for Mean			
	N	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Minumum**	**Maximum**
Strong	47	39.7234	23.48052	3.42499	32.8293	46.6175	16.00	103.00
Weak	54	39.85919	21.74848	2.95959	33.9157	45.7880	16.00	106.00
Control	54	40.5556	19.01307	2.58735	35.3660	45.7451	16.00	91.00
Total	155	40.0581	21.26067	1.70770	36.6845	43.4316	16.00	106.00

ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	20.925	2	10.463	.023	.977
Within Groups	69589.552	152	457.826		
Total	69610.477	154			

Table 3. Purchase intention among three conditions

PI_TOT=Purchase intention score
Strong = strong tie (close friends)
Weak = weak tie (distant friends)
Control = control

Correlations

		SC_DIFF	**PI_TOT**
SC_DIFF	Pearson Correlation	1	-.271**
	Sig. (2-tailed)		.001
	N	155	155
PI_TOT	Pearson Correlation	-.271**	1
	Sig. (2-tailed)	.001	
	N	155	155

** Correlation is significant at the 0.01 level (2-tailed)

Table 4. Correlation between Self-control difference and Purchase Intention Score
SC_DIFF = Self-control difference
PI_TOT = Total Purchase Intention Score

Descriptives

					95% Confidence for Mean			
	N	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Minumum**	**Maximum**
White	47	33.6596	17.96165	2.61998	28.3858	38.9333	16.00	103.00
Asians	91	44.3736	22.86173	2.39656	39.6124	49.1348	16.00	106.00
Total	138	40.7246	21.85512	1.86043	37.0458	44.4035	16.00	106.00

ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	3557.686	1	3557.686	7.819	.006
Within Groups	61879.850	136	454.999		
Total	65437.536	137			

Table 5. Purchase Intention Score between Asians and Whites

PI_TOT=Purchase intention score

Descriptives

					95% Confidence for Mean			
	N	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Minumum**	**Maximum**
Strong	47	-.0402	.23448	.03420	-.1090	.0287	-.56	44
Weak	54	-.0535	.28038	.03815	-.1300	.0230	-.89	.89
Control	54	-.0206	.23454	.03192	-.0846	.0434	-.56	.44
Total	155	-.0380	.25020	.02010	-.0777	.0017	-.89	.89

ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	.030	2	.015	.234	.792
Within Groups	9.611	152	.063		
Total	9.640	154			

Table 6. Purchase intention among three conditions

C_diff = Conscieniousness difference (Time2 - Time1)
Strong = strong tie (close friends)
Weak = weak tie (distant friends)
Control = control

Appendix 1

Top selling Internet products
Source: http://www.statisticbrain.com/top-selling-internet-items/

Top Selling Internet Products	Annual Sales	Market Share
Software, Books, Music, Flowers	$37.05 billion	26%
Computer Hardware, Consumer Electronics, Office Supplies	$22.8	16%
Apparel, Footwear, Jewelry, Linens / Home Decor	$26	13%
Health, Beauty, Food and Beverages	$11.4	8%
Toys, Video Games, Sporting Goods	$9.975	7%
Small Appliances, Furniture, Tools, Garden Equipment	$4.275	3%

Rank	Rank of Best Selling Internet Products
1	Women's Apparel
2	Books
3	Computer Hardware
4	Computer Software
5	Apparel
6	Toys / Video Games
7	Video DVD's
8	Health and Beauty
9	Consumer Electronics
10	Music
11	Jewelry
12	Office Supplies
13	Linens / Home Decor
14	Flowers
15	Sporting Goods
16	Footwear
17	Small Appliances
18	Tools and Garden
19	Gifts

Appendix 2

Purchase Intention Scale

	Very Unlikely	**Unlikely**	**Somewhat Unlikely**	**Undecided**	**Somewhat Likely**	**Likely**	**Very Likely**
... buy clothing?							
... buy a laptop / computer?							
... buy reading materials (book, ebook, magazines, etc.)							
... buy / download new music (digital / hard copies)							
... buy computer accessories (monitor, mouse, keyboard, headphone, USB flash drive)							
... buy a pair of shoes?							
... buy a phone / tablet?							
... buy small accessories (sunglasses, wallet / purse, phone case, cable / charger...)							
... buy / download entertainment softwares							
... buy / download / stream paid content (movies, shows)							
... buy stationary / office supplies							
... buy work-related softwares (Microsoft office, Adobe products)							
... buy health / beauty products (vitamin, supplement, skin care...)							
... buy consumer electronics (camera, mp3 player...)							
... buy high-end consumer electronics (TV, home theater system, washer machine...)							
... buy jewelry (watch, bracelet, ring, necklace...)							