

Title: Money Buys Happiness When Spending Fits Our Personality

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Abstract:

In contrast to decades of research reporting surprisingly weak relationships between consumption and happiness, recent studies suggest that money can indeed increase happiness if it is spent the “right way” (e.g. on experiences or on others). Drawing on the concept of psychological fit, we extend this research by arguing that individual differences play a central role in determining the “right” type of spending to increase wellbeing. In a field study with over 76,000 bank transaction records we find that individuals spend more on products which match their personality and that those whose purchases match their personality report higher levels of life satisfaction. This effect of psychological fit on happiness was stronger than the effect of individual’s total income or their total spending. A follow-up experiment showed a causal effect: Personality-matched spending increases positive affect. In summary, when spending matches personality, it appears that money can indeed buy happiness.

Above a low baseline, money is reported to have a surprisingly weak relationship with overall wellbeing (Ed Diener & Biswas-Diener, 2002; Kahneman & Deaton, 2010). However, recent studies have questioned this conclusion, arguing that if money does not buy happiness, it is because we are not spending it “right” (Dunn, Gilbert, & Wilson, 2011). These studies suggest that spending can indeed lead to greater well-being if it is directed at experiences rather than material goods (Carter & Gilovich, 2010; Howell & Hill, 2009; Van Boven & Gilovich, 2003), buying for others as opposed to ourselves (Dunn, Aknin, & Norton, 2013), and obtaining many small pleasures as opposed to a few large ones (Nelson & Meyvis, 2008).

However, recent research suggests that these relationships do not hold universally, as individual differences moderate at least some of them (Hill & Howell, 2014; Millar & Thomas, 2009; Zhang, Howell, Caprariello, & Guevarra, 2014). For example, while experiential purchases consistently result in greater happiness for experiential buyers, the effect is smaller or non-existent for material buyers (Zhang et al., 2014). Similarly, spending more on others does not increase happiness for those whose values do not emphasize a concern for others (Hill & Howell, 2014). These findings highlight the need to understand the effect of spending on happiness at the individual rather than the group level.

As the focus shifts away from identifying types of spending that increase people’s happiness and toward finding types of spending that help increase an *individual’s* happiness, psychological theory offers a valuable point of reference. Years of research show that people’s preferences across a large variety of domains are driven by a relatively stable set of psychological characteristics: their personality (Ozer & Benet-Martínez, 2006). The Big Five model of personality is the most widely accepted personality model (Goldberg, 1992; McCrae & John, 1992). It posits the five personality traits of openness to experience (artistic vs. conservative), conscientiousness (self-controlled vs. easy-going), extraversion (outgoing vs. reserved), agreeableness (compassionate vs. antagonistic), and neuroticism (emotionally unstable vs. stable).

Individuals have consistently been found to favor people and environments which match their personality traits, with those who experience psychological fit also reporting higher levels of well-being and overall life satisfaction (Assouline & Meir, 1987; Carli, Ganley, & Piercy-Otay, 1991; Jokela, Bleidorn, Lamb, Gosling, & Rentfrow, 2015). This is because psychological fit helps individuals to act in line with their most fundamental needs and preferences as well as to express themselves in a way which maintains and enhances their self-concepts (Grubb & Grathwohl, 1967; Lecky, 1945; Levy, 1959). Surrounding oneself with like-minded artists or

living in a culturally “hip” area full of bars and art galleries, for example, helps an artistic person to act upon her preferences and to reinforce her self-concept of being a ‘creative and open-minded individual’.

Consumer psychology and marketing research suggests that the theory of psychological fit can also be applied to consumption, as spending on products and services constitutes a form of self-expression. While some spending is essential to fulfill basic needs such as food and shelter, discretionary spending beyond this baseline often reflects who we are as individuals. We buy products not only for what they can do but also for what they mean to us (Levy, 1959). Parts of this symbolic meaning are captured by psychological traits: Consumers associate and imbue products and brands with human personality characteristics (Aaker, 1997; Govers & Schoormans, 2005; Huang, Mitchell, & Rosenaum-Elliott, 2012). For example, people perceive the Wall Street Journal as competent while they associate MTV with excitement (Aaker, 1997). Building on the notion of product and brand personality, numerous laboratory studies have shown that consumers indeed report more favorable attitudes, emotions, and behaviors towards brands and products which match their own personality characteristics (Aaker, 1999; Govers & Schoormans, 2005; Sirgy, 1985). For example, an extrovert may prefer spending which reinforces her preference for social activities (e.g. eating out with friends). As extroverts’ momentary happiness is known to increase when they are engaged in activities with others (Oerlemans & Bakker, 2014) such spending may also help regulate their immediate emotional states and long-term well-being

In this paper, we propose that spending provides the greatest increase in happiness and wellbeing when it is on goods and services which match consumers’ personality. We test this proposition in two studies: Study 1 uses transaction data from 625 UK customers of a multinational bank to test whether consumers spend more money on products which match their personality (Hypothesis 1) and whether those consumers whose purchases better fit their personalities report higher levels of life satisfaction (Hypothesis 2). Study 2 tests the implied causality of Hypothesis 2 in a controlled experiment ($N = 79$) in which individuals were given vouchers to spend on products that either matched or mismatched their personality.

Study 1

Methods

Participants and measures.

The dataset used in Study 1 was collected in collaboration with a UK-based multinational bank in late 2014. Customers of the bank were sent a survey link by email asking them to take part in a study (N=150,000). No incentives were offered for taking part in the survey. The survey included the BFI-10 personality questionnaire, which is an established short measure of the Big Five Model of personality (Rammstedt & John, 2007), as well as the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). As part of the survey, customers were asked to consent to their responses being matched with the personal transaction data held by the bank for research purposes. The records encompassed detailed transaction data of all transactions going out of customers' checking accounts over a period of six months. Individuals' purchases were automatically grouped by the bank into 112 categories. We excluded categories that did not allow for a meaningful interpretation (e.g. "unallocated" or "services other") or had fewer than 500 transactions in order to reduce the sparsity of the transaction matrix and increase the reliability of results. Using the cut-off of 500 allowed us to reduce the number of categories to a manageable level so that they could be rated on their perceived psychological traits, while at the same time retaining a sufficient level of product diversity. We further merged closely related categories (e.g. "medical charities," "children's charities," and "charities other" became "charities")*, resulting in a total of 59 spending categories. Of the 1,013 people who completed the study, 912 (90%) agreed to have their survey responses matched with their account records (51% female; \bar{x} (age) = 37.2 years, SD = 14.5). For reasons of reliability, we only included participants (i) who had completed the full BFI-10 and SWL scale, (ii) for whom information on income, total spending, age, and gender was available, (iii) who had indicated that the account was their main account, and (iiii) who had transactions for at least 10 of the 59 transaction categories. This left us with 625 participants and 76,863 transactions (63% of original transactions).

Rating personality traits of spending categories.

We recruited 100 workers on Amazon's Mechanical Turk to rate the spending categories according to the Big Five personality dimensions. Using the Ten-item Personality Inventory

* Supplementary material A replicates the analyses of Studies 1 and 2 with discretionary spending only. Since there are no significant differences between models, we report the results from the full dataset.

(TIPI; Gosling et al., 2003), we created a seven-point scale for each personality trait e.g. from “quiet/reserved” (-3) to “extraverted/outgoing” (3). For each participant, 30 categories were randomly selected from the pool of 59 categories. Participants received the following instructions: “On the following pages we are going to show you a number of categories that people can spend their money on (e.g. travel or entertainment). We would like you to think of each category as if it were a person. This may sound unusual, but think of the set of human characteristics associated with each spending category. We’re interested in finding out which personality traits or human characteristics come to your mind when you think of a particular spending category. There are no wrong or right answers” (adapted from Aaker, 1997). Participants’ responses were subsequently prompted by the question “If this 'spending category' was a person, how would it best be described?” Personality scores for each of the spending categories were aggregated across respondents, with scores larger than zero indicating products that were perceived to have high trait characteristics and scores lower than zero indicating products that were perceived to have low trait characteristics. For example, the average extraversion score for the category “books” was $\bar{x}(E) = -0.82$, suggesting that people perceive books to be introverted. Table 1 displays the personality means for each of the 59 spending categories.

Table 1. Personality means of the 59 spending categories rated on Amazon Mechanical Turk

(Continued)

Category	O	C	E	A	N	Category	O	C	E	A	N
Accountants' fees	-1.81	2.02	-1.40	-0.68	-0.62	Gardening	0.59	1.75	-0.73	1.94	-1.59
Advertising services	1.98	0.70	2.04	-0.04	0.34	Gift shops	0.83	0.94	0.55	1.74	-0.94
Airports & duty free	-0.50	0.96	0.34	-0.18	-0.02	Hair & beauty	1.91	0.31	1.49	0.85	0.22
Arts & crafts	2.51	0.20	1.05	1.71	-0.46	Hardware	-0.78	1.73	-0.61	0.04	-1.22
Bakers & confectioners	1.45	1.59	0.86	1.41	-0.80	Health & fitness	0.32	2.22	1.29	1.00	-0.93
Books	1.71	1.92	-0.82	1.53	-1.39	Health insurance	-1.61	1.52	-1.11	-0.16	-0.50
Cable & satellite TV	0.48	0.00	1.29	-0.17	0.14	Home furnishing	0.63	1.48	0.17	1.38	-1.22
Car hire	-0.53	1.39	-0.06	0.31	-0.96	Home insurance	-2.05	2.40	-1.46	0.33	-1.48
Caravans & camping	1.65	0.60	1.51	1.00	-0.64	Hotels	-0.16	1.69	0.31	1.55	-1.63
Catalogue & bargain stores	-0.34	-0.27	0.35	0.54	-0.21	Jewelry	1.60	0.73	1.43	0.96	-0.61
Charities	-0.35	1.65	0.10	2.31	-1.39	Life assurance	-1.30	2.21	-1.02	1.11	-1.25
Cinema	2.30	0.22	1.75	0.71	-0.02	Mobile telephone	1.02	1.33	1.65	0.33	-0.13
Clothes	0.83	0.44	0.96	0.89	-0.44	Motor sports	1.34	0.09	2.32	-0.55	0.82
Coffee shops	0.89	1.24	0.45	1.79	-1.23	Music	2.61	0.12	2.33	0.94	0.15
Computers & technology	1.36	2.05	0.28	0.19	-1.00	Newsagents	-0.22	0.76	1.06	-0.29	0.12
Confectioners & tobacconists	0.75	0.21	0.77	0.42	-0.06	Pets	1.14	0.08	2.04	1.98	0.24
Days out & tourism	2.19	0.57	2.25	1.10	-0.28	Photography	2.33	0.69	1.44	1.09	-0.33

Dental care	-1.25	1.79	-0.59	0.32	-0.59	Residential mortgages	-2.10	1.98	-1.40	-0.48	-0.85
Department stores	-0.30	1.28	0.70	0.57	-0.62	Shoe shops	0.40	1.19	0.43	0.58	-0.77
Digital	1.55	1.05	0.77	0.02	-0.45	Sports	1.44	1.30	2.24	-0.41	0.77
Discount stores	-0.17	-0.42	0.32	0.28	0.19	Stationery	-0.14	1.98	-0.78	1.51	-1.63
DIY	2.22	1.37	1.20	0.98	-0.54	Subscriptions	-0.43	1.42	-0.26	0.44	-0.86
Eating out – pubs	1.35	-0.41	2.22	0.40	0.48	Supermarkets	-0.69	1.27	0.51	0.58	-0.73
Eating out – restaurants	1.56	0.44	1.74	0.91	-0.39	Takeaways	0.84	-0.07	1.16	0.23	-0.19
Electronic commerce & IT	0.93	1.36	0.33	0.15	-0.80	Toys & hobbies	2.19	-0.90	1.94	0.78	-0.06
Entertainment	2.67	-0.43	2.51	0.31	0.49	Traffic fines	-2.25	0.91	-0.58	-2.33	1.34
Family clothes	-0.28	0.43	0.00	1.16	-0.96	Travel	2.51	0.24	2.37	1.18	-0.20
Florists	1.69	1.38	1.13	1.87	-0.98	TV license	-0.17	1.29	0.26	-0.33	-0.39
Foreign travel	2.54	0.65	2.15	0.85	-0.11	Unions & subscriptions	-1.04	1.26	0.42	-0.58	0.25
Gambling	1.55	-2.08	2.33	-1.81	1.98						

Note. Intraclass Correlation Coefficients (ICCs) were calculated as a measure of interrater agreement. ICCS ranged from .82 to .98 indicating high interrater agreement across all categories. Scores are on a 7 point scale from -3 to +3.

Results

Hypothesis 1

To test whether consumers spend more money on products that match their personality (Hypothesis 1), we first aggregated the transaction data across the six months to calculate each individual's total spending on each spending category (e.g. the total amount a participant spent on books). In a second step, we z-standardized the raw personality scores of participants and products to calculate the relative position of each person and product on all of the Big Five personality traits. An extroversion score of $z = 1$, for example, indicates that the person or product is one standard deviation above the average person and product extroversion score (see Figure S1 and S2 for the distributions of scores). Finally, we calculated the degree of similarity between the z-standardized personality scores of a consumer i and that of a spending category s (*product person match*) using Euclidean distance, a commonly used measure of similarity (Deza & Deza, 2009). To facilitate the interpretation of results, we subtracted the score from the mean so that higher scores on the matching variable would indicate a better match:

$$product\ person\ match_{i,s} = \text{mean} - \sqrt{(z(Op_i) - z(Op_s))^2 + \dots + (z(Ne_i) - z(Ne_s))^2}$$

Given that there were multiple observations per participant, we used hierarchical linear modeling analysis with random intercepts (HLM, Raudenbusch & Bryk, 2002) to establish the effect of product-person match on the amount spent. To test the robustness of the effect we also included control variables that have previously been shown to predict financial behavior and

well-being (DeNeve & Cooper, 1998; Ed Diener & Biswas-Diener, 2002): age, gender, income, overall spending (Model 1) as well as participants' and products' Big Five personality traits (Model 2). All continuous variables were grand-mean centered before being submitted to the analysis. Table S1 displays the zero-order correlations between predictors.

The results reported in Table 2 show that the match between a participant's personality and that of the spending category was a significant predictor of the amount spent. This indicates that on average people spent more money on products which matched their personalities. For example, a person with an extraversion score in the 84th percentile (+1SD) spent approximately £52 (\$77) more each year on "pub nights" than a person with an extraversion score in the 16th percentile (-1SD). Similarly, a person with a conscientiousness score in the 84th percentile spent £124 (\$183) more annually on "health and fitness" than a person with a conscientiousness score in the 16th percentile. The effect remained significant, even when controlling for demographic variables (Model 1), and consumers' as well as product personality (Model 2).

Table 2. Hierarchical linear models with logged amount as outcome. The analyses are based on 11,279 observations from 625 participants. *b* = unstandardized coefficients. Pseudo-*R*² are calculated as the correlation of fitted vs. observed values). * $p < .05$, ** $p < .01$, *** $p < .001$.

Predictors	Model 1			Model 2		
	<i>b</i>	<i>CI</i> ₉₅	<i>t</i>	<i>b</i>	<i>CI</i> ₉₅	<i>t</i>
P-P-match	.09***	.07 – .12	6.75	.03*	.01 – .06	2.40
Income (log)	.05	-.02 – .10	1.62	.04	-.02 – .10	1.44
Total spend (log)	.33***	.27 – .40	10.96	.32***	.26 – .38	10.91
Gender	.06	-.003 – .12	1.84	.02	-.04 – .09	0.75
Age	.01***	.003 – .01	4.50	.004***	.002 – .01	3.51
Person-O				.01	-.02 – .03	.49
Person-C				.02	-.01 – .04	1.05
Person-E				-.02	-.05 – .01	-1.46
Person-A				-.02	-.05 – .01	-1.30
Person-N				-.02	-.05 – .01	-1.08
Product-O				-.58***	-.62 – -.54	-21.96
Product-C				.16***	.11 – .22	6.50
Product-E				.91***	.85 – .98	25.52
Product-A				-.37***	-.44 – -.31	-11.42
Product-N				-.53***	-.63 – -.43	-11.16
Pseudo- <i>R</i> ²		.06			.14	

Hypothesis 2

To test whether consumers with a better fit between their personalities and their overall purchases reported higher levels of life satisfaction (Hypothesis 2), we calculated the personality profile of a consumer's shopping basket by averaging and standardizing the personality scores of all the spending categories for which the participant had made at least one purchase. Based on research showing that many small purchases can result in greater happiness than a few large ones (Dunn, Gilbert, & Wilson, 2011), we assigned an equal weight to all spending categories rather than weighting them by the amount spent. The personality of consumers' shopping baskets therefore reflects the average personality profile of their overall spending, relative to that of the other people in our sample. For example, if a consumer has purchased more products perceived to be extroverted than the average person (e.g. pubs or motor sports) and/or purchased less products perceived to be introverted than the average person (e.g. gardening or health insurance), then their shopping basket personality will be extroverted. Similar to the product-person match we subsequently used Euclidean distance (Deza & Deza, 2009) to establish the degree of similarity between the personality of a consumer i and that of her shopping basket b (*basket person match*) and subtracted the score from the mean:

$$\text{basket person match}_{i,b} = \text{mean} - \sqrt{(z(Op_i) - z(Op_b))^2 + \dots + (z(Ne_i) - z(Ne_b))^2}$$

In three multiple linear regression analyses, we regressed life satisfaction on the basket-person match predictor. Consistent with the previous analysis we included age, gender, income, overall spending (Model 1) and participants' as well as products Big Five personality traits as controls (Model 2). We added the extremity of participants' personality scores (average of absolute Big Five scores) in Model 2 to control for the possibility that people with more extreme – and thus less normative – personalities might report lower levels of life satisfaction. Table S2 displays the zero-order correlations between predictors.

As hypothesized, the degree of fit between a participant's personality and that of her shopping basket was found to be a significant predictor of life satisfaction (see Table 3). Consumers who bought products which matched their personality reported higher satisfaction with their lives, and this effect was stronger than that of total income or total spend. When adding basket personality to the model the effect of basket-person match became marginal at an alpha level of $\alpha = .05$ ($p = .062$)[†]. This change in significance results from a slightly larger standard error of the

[†] When analyzing discretionary spending only, the effect of Basket-Person match remained significant in Model 2 (see table S7 in Supplementary Material B).

coefficient estimate (see confidence intervals) which might have been caused by the multicollinearity of the additional predictors. While a person's extroversion and neuroticism level were found to be significant predictors of life satisfaction none of the basket personality main effects reached significance. This indicates that there are no general purchase characteristics that predict a person's level of life satisfaction.

Table 3. Multiple linear regression analyses of life satisfaction on “basket–person match” (B-P-match) and controls (624 observations). * $p < .05$, ** $p < .01$, *** $p < .001$.

Predictors	Model 1			Model 2		
	b	CI ₉₅	t	b	CI ₉₅	t
B-P-match	.06*	.003 – .12	2.07	.06	-.003 – .13	1.87
Income (log)	.02	-.11 – .15	.35	.04	-.08 – .17	.70
Total spend (log)	.06	-.07 – .20	.96	.02	-.11 – .15	.26
Gender	.03	-.11 – .17	.37	-.02	-.17 – .13	-.26
Age	-.01*	-.01 – .0002	-2.07	-.01*	-.01 – .002	-2.53
Person-O				.04	-.02 – .10	1.28
Person-C				< -.001	-.07 – .07	-.01
Person-E				.09*	.02 – .16	2.39
Person-A				.01	-.06 – .07	.18
Person-N				-.23***	-.30 – .15	-6.11
Extremity				.06	-.17 – .28	.51
Product-O				-.12	-.25 – .02	-1.72
Product-C				.08	-.04 – .20	1.26
Product-E				.16	-.01 – .33	1.82
Product-A				.10	-.05 – .25	1.36
Product-N				.05	-.17 – .26	.42
Adjusted R ²		.01			.11	

Study 2

Given the correlational nature of the data in Study 1, it is difficult to make causal claims. Although it seems intuitive that spending more money on products that match our personality results in higher life satisfaction, higher life satisfaction could also result in people recognizing and acting on their needs more successfully. Focusing on the trait of extraversion, which is considered to be more informative in understanding and predicting individual's behaviour than other traits (Williams, Munick, Saiz, & FormyDuval, 1995), we ran a follow-up experiment to test our causal hypothesis.

Methods

Participants.

We used the “pwr package” in R (Champlsey, 2015) to establish the required sample size for general linear models with the following parameter specifications: degrees of freedom in numerator $u = 3$, significance level $\alpha = 0.05$, power $(1-\beta) = 0.8$ and effect size $f^2 = 0.15$ (corresponding to a medium effect size as defined by Cohen, 1988). The recommended sample size was $N = 76$. Participants were recruited via university mailing lists. Students who registered their interest were invited to complete a pre-screening test which included the 50-item IPIP (Goldberg, 1992). From the 142 respondents, we invited the top and bottom thirds on the extraversion trait to take part in the main study. The difference in extraversion level for the 79 participants (N introverted group = 43, N extraverted group = 36) was $z = 1.90$ SD ($t(76) = 17.12$, $p < .001$). The average age was $\bar{x} = 20.65$, and 68% of participants were female.

Measures and procedure.

We randomly allocated £7 (approximately \$10 USD) vouchers for either a bookshop (introverted proxy) or a bar (extraverted proxy) to groups of introverted and extraverted participants. Participants were unaware of the different conditions: The initial invitation to participate in the study only mentioned a “non-monetary compensation in the form of a voucher” and participants were asked to not discuss the study with anyone. All participants underwent the following procedure (see Figure 1 for visual illustration): Before receiving any information about the study they were asked to complete a baseline questionnaire (T1) that measured the PANAS scale to which the additional adjective of “happy” was added (Watson, Clark, & Tellegen, 1988; see Dunn et al., 2013 for a similar approach). They subsequently received a voucher with a requirement to spend it within the next two days. The only restriction given to participants was that those in the book condition needed to spend their voucher on a book, and participants in the bar condition, on an item which could be consumed in the bar. Immediately after receiving the voucher, participants were asked to complete the second questionnaire (T2) with the same PANAS items (example of instruction: “You should have just received a voucher for the Union bar. Please complete the following questionnaire in light of this experience.”). After completing the second questionnaire they were told that there would be two more questionnaires to complete: The third (T3) after they had cashed the voucher (on the spot at the bar or bookshop, where staff members had been briefed to hand out questionnaires) and the fourth (T4) after spending at least 30 minutes at the bar or reading the book. Both questionnaires included the same PANAS items as in the previous questionnaires (example of instructions at

T3: “You should have just cashed your voucher. Please complete the following questionnaire in light of this experience.” And at T4: “You should have spent some time at the bar/reading the book. Please complete the following questionnaire in light of this experience.”). Participants who completed all four questionnaires were paid £5 (\$7.50). All 79 participants completed questionnaires T1 and T2, 75 completed T3 and 74 completed T4 (notably, all drop-outs were from mismatching conditions).

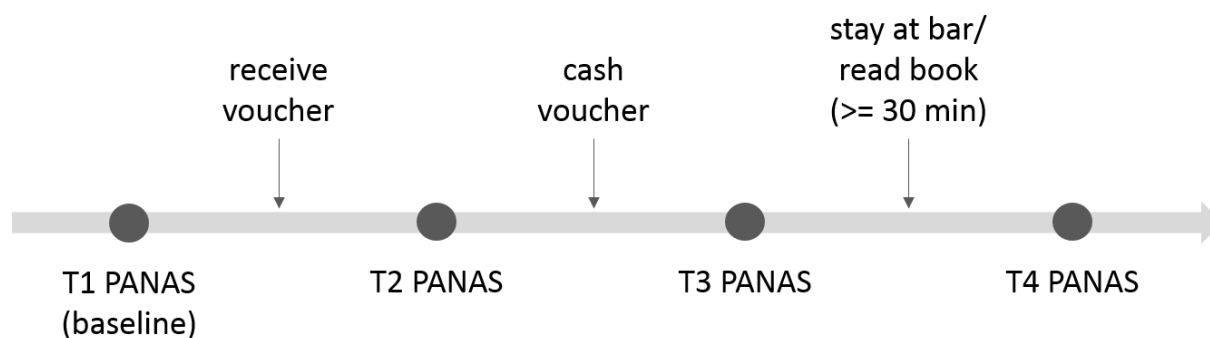


Fig 1. Experimental procedure from the participant’s perspective.

Results

The raw means and standard deviations of the four assessment points across conditions are shown in Table S3. As we were interested in the overall effect of personality-matched spending, we averaged participants’ scores across T2, T3 and T4 to form a composite happiness measure (“Happiness overall”, see Table S4 and Figure S5 in supplementary Material for individual results across the three time points). We submitted “Happiness overall” to a linear regression model with participants personality (extraverted vs. introverted) and product personality (extraverted vs. introverted) and their two-way interaction as predictors as well as the happiness score at T1 as covariate. The analysis revealed significant main effects of participant and product personality as well as a significant interaction effect between participant and product personality (see Table 4), indicating that personality-matched consumption indeed results in higher levels of happiness.

Table 4. Multiple linear regression of ‘Happiness overall’ on participant and product personality, their interaction, as well as T1 as covariate. $N = 79$.

	b	CI_{95}	t
Participant Personality	-8.26*	-14.76 – -1.76	-2.53

Product Personality	-11.13***	-17.49 – -4.77	-3.49
Participant Personality × Product personality	5.89**	1.79 – 9.96	2.86
Happiness T1	.82***	.68 – .95	12.19

Figure 2 displays the results for matching vs. mismatching conditions in comparison to the baseline T1. While participants' happiness in the matching conditions was significantly above the baseline across all happiness indicators, it remained mostly stable and even decreased in one of the mismatching conditions. This finding suggests that mismatched spending may not only fail to improve people's well-being but could even be detrimental to it. The harmful effect of 'misfit' is in line with previous research in occupational psychology, which shows that working in an environment with poor psychological fit leads to lower levels of job satisfaction and higher levels of mental stress (Furnham & Schaeffer, 1984; Caplan & Harrison, 1993). The effects of psychological fit were found to be more pronounced for introverted participants. A possible explanation for this finding is that extroverted people are more positive and optimistic in general (Costa & McCrae, 1980; Marshall, Wortman, Kusulas, Hervig, & Vickers, 1992), which in turn might lead them to consider themselves satisfied with most of the purchases they make. The significant main effects of product personality (overall preference for the book voucher) and participant personality (higher happiness ratings for introverted participants) can largely be explained by the two aforementioned interaction patterns: The main effect of product personality is a result of the fact that introverts show a strong preference for the book voucher whereas extroverts show no preference for any of the products. Similarly, the main effect of participant personality stems from introverts' happiness increase in the matching condition being larger than their decrease in happiness in the mismatching condition.

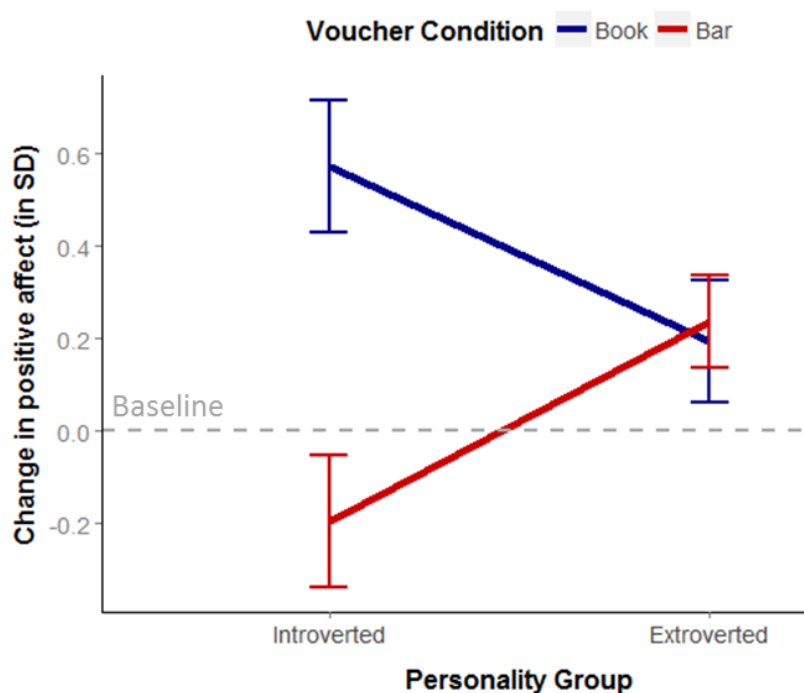


Fig 2. Interaction effect of participant and product personality on changes in overall positive affect(‘Happiness overall’ – ‘Happiness T1’). The change in positive affect is displayed in standard deviations of the baseline assessment (T1) and indicates changes in positive affect from the baseline (dashed grey line). Error bars are standard errors of the mean.

Discussion

In line with previous research on the link between psychological fit and well-being (Assouline & Meir, 1987; Carli et al., 1991; Jokela et al., 2015) our results show that individuals’ happiness can be increased through the consumption of products which match their psychological characteristics. People spend more money on products that match their personality (Hypothesis 1). Assuming that people intend to buy products that increase their happiness, this finding provides a first indication that personality-matched purchases are related to greater satisfaction. However, since research shows that people often fail to predict the affective outcomes of their consumption decisions accurately (Wilson & Gilbert, 2005), we further support this hypothesis by showing that people whose purchases better fit their personality indeed report higher levels of life satisfaction (Hypothesis 2). The results of the experimental study suggest that this effect is causal: Personality-matched spending increases happiness. In order to confirm that this effect is indeed driven by psychological fit rather than potentially confounding attributes of the two specific purchases (book and bar), future research should replicate our findings using different products.

Our findings contribute to the academic discourse and existing psychological literature in two ways. First, they support recent studies showing that money can indeed increase happiness if it is spent “right”. However, by focusing on an individual’s rather than everybody’s happiness, our approach provides the opportunity to better understand the underlying mechanisms of when and why spending leads to increased happiness. For example, while previous research suggests that spending money on experiences results in greater happiness (Carter & Gilovich, 2010; Van Boven & Gilovich, 2003), the results of our experimental study suggest a more nuanced picture. Introverted participants reported higher levels of happiness when they received the material good (book) rather than the experience (bar visit). This might be explained by the social interaction commonly linked to experiential spending (Caprariello & Reis, 2012). While extroverted people enjoy social experiences, introverted people might benefit more from material goods or experiences that they can consume on their own. However, given that the book purchase contains both material and experiential aspects (owning and reading the book), future research should replicate this finding more directly. Second, our findings support the literature on self-congruity (Sirgy, 1985). While previous research approximated spending with self-reported purchase intention or history (Aaker, 1999; Huang, Mitchel and Elliot, 2012; Sirgy, 1985) we extracted spending directly from transaction records. In doing so we were able to overcome the limitations of self-report measures and produce robust results with high external validity.

The correlational versus experimental set-up of Studies 1 and 2 makes it necessary to distinguish between descriptive and prescriptive conclusions respectively. Given the lack of causation, the results of Study 1 should not be taken as the basis for advising people on how to spend their money. Indeed, while the fit between a consumer’s personality and that of his/her shopping basket significantly predicts their life satisfaction overall, it seems unlikely that an introvert would experience the greatest increase in life satisfaction by intentionally spending more on accountant fees or home insurance (products with the lowest extroversion level). However, it is possible that psychological fit acts as a buffer for dissatisfaction when people are forced to spend money on products which are not inherently satisfaction-inducing. For example, an introvert might be less negatively affected than an extrovert when required to spend money on accountants’ fees, thereby driving the overall relationship between psychological fit and life satisfaction. The results of Study 2, however, are causal and can therefore serve as the basis for advising people on how to make spending an aid to the pursuit of a happy life. When people

have a choice between two products of similar valence, they should choose the one that best fits their own psychological characteristics.

Our findings have implications that reach far beyond the academic discourse. Prescriptive insights into which products are most likely to increase an individual's happiness, for example, could be used in personalized recommendation systems (e.g. Amazon's "People who bought X also bought Y"). While such personalization systems are generally profit-driven and often perceived by consumers as a manipulative method for companies to increase revenue, our results suggest that personalization systems could also benefit consumers. In the digital environment in particular, where consumers can be overwhelmed by choice (Schwartz & Ward, 2004), retailers may benefit their customers by guiding them towards fitting products. For example, highly agreeable customers could be matched to products which best fulfil their desire to help others, such as opportunities to donate to charity. Highly conscientious individuals, on the other hand, could be given the opportunity to exercise their self-discipline through fitness products.

Our results raise new questions that should be addressed by future research: Why are some people better at buying fitting products than others? And what are the mechanisms by which psychological fit increases life satisfaction? Although our results suggest that consumers attempt to allocate greater resources to products that match their personality, there were considerable differences in the extent to which consumers' overall expenditure matched their personalities. Follow-up studies should investigate the underlying causes for these differences. For example, individual differences in the tendency for self-reflection and the awareness of one's personal needs (Trapnell & Campbell, 1999) could make some people more successful in identifying fitting products than others. However, the differences could also be driven by factors external to the individual. People with low income, for example, have less money available for discretionary purchases, and other people might allocate a large proportion of their resources to family members rather than themselves. Unveiling such mechanisms would improve our understanding of when and why personality-matched spending results in greater happiness and satisfaction. Furthermore, future research should investigate the two aforementioned pathways through which psychological fit could affect well-being: as a facilitator of satisfaction or a buffer against dissatisfaction. Similar to preventing and reducing stress in the work place (Furnham & Schaeffer, 1984), psychological fit might help people "cope" with involuntary purchases (e.g. when discretionary spending is restricted due to low income). Distinguishing

between the two mechanisms might provide valuable insights into the long-term consequences of personality-matched consumption on psychological and mental well-being.

Taken together, the results suggest that for each individual there are optimal and suboptimal ways to allocate spending: Purchases which make one person happy might not do so for another. Finding the right products to maintain and enhance one's preferred lifestyle could turn out to be as important to well-being as finding the right job, the right neighborhood or even the right friends and partners. As the science of happiness becomes more sophisticated, psychology may begin to provide more personalized advice on how to find happiness through consumption.

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<http://doi.org/10.1016/j.jrp.2014.03.007>

Supplementary Materials:***A – Supplementary Figures and Tables***

Figures S1-S5

Tables S1-S5

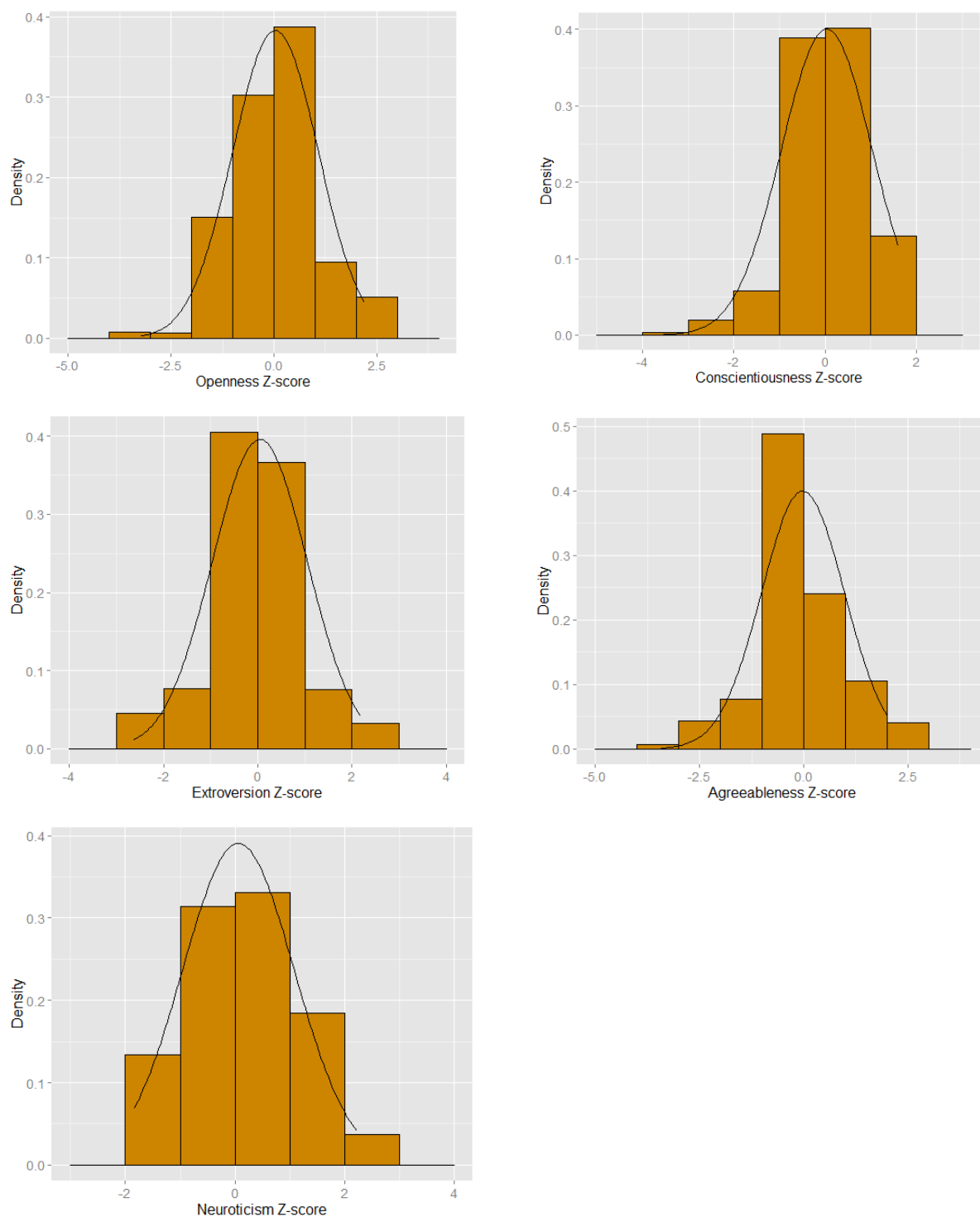
Figure S1. Distribution of z-standardized personality scores of participants (“Human personality scores”)

Figure S2. Distribution of z-standardized personality scores of products (“Product personality scores”)

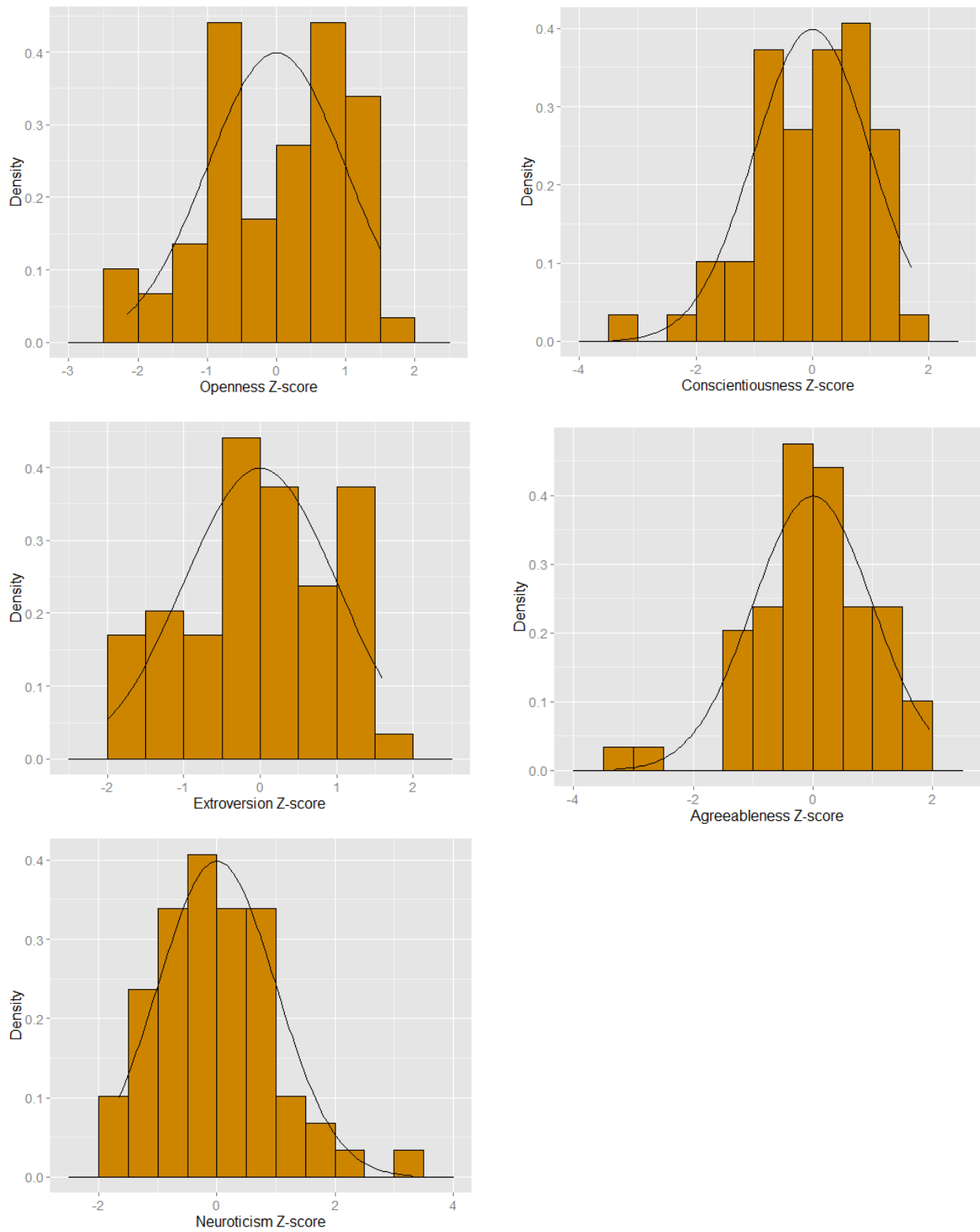


Figure S3. Distribution of z-standardized personality scores of shopping baskets (“Basket personality scores”)

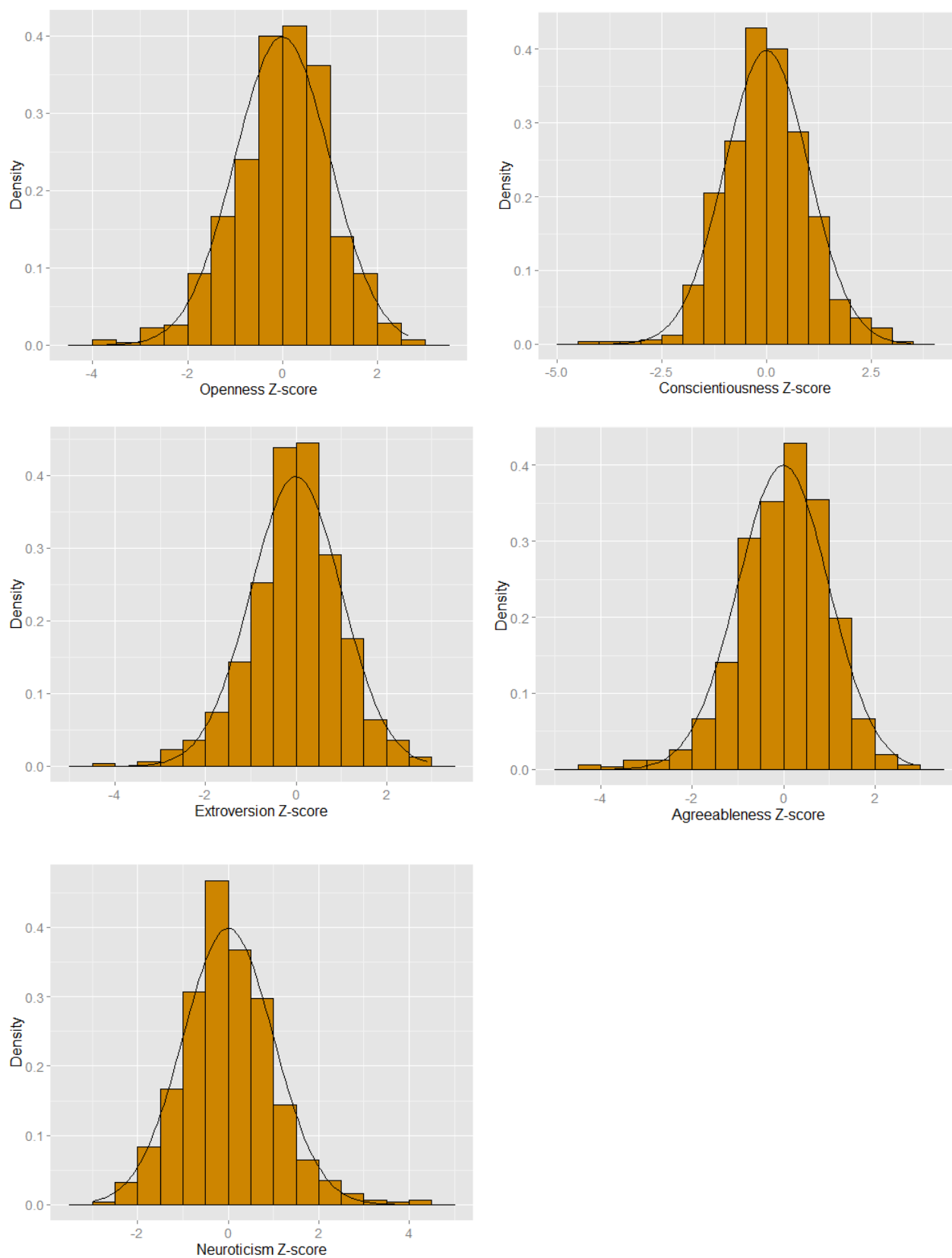


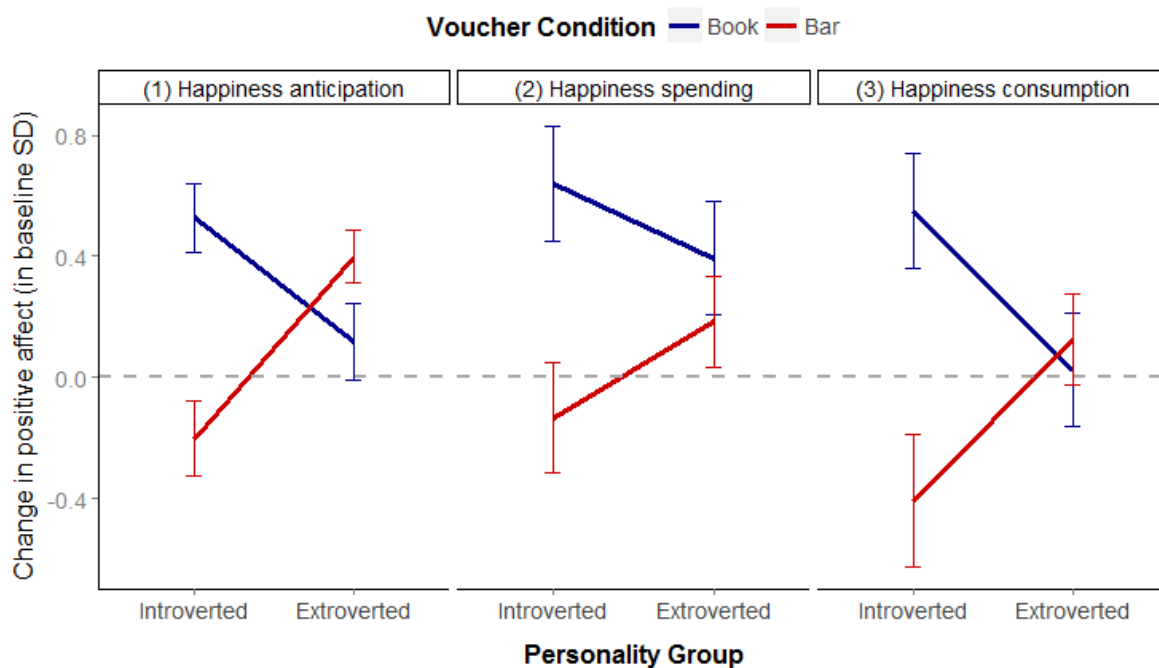
Figure S4. Distributions of happiness indicators.**Figure S5.** Interaction effects of participant and product personality on changes in positive affect at different stages of the consumption process. Displayed are the three happiness indicators (facet grids) in standard deviations of the baseline assessment, which indicate changes in positive affect from the baseline (dashed grey line). Error bars are standard errors of the mean.

Table S1. Zero order correlations between predictors in multiple linear regression analyses (Hypothesis 2). N = 11,279. All correlations > |0.015| are significant.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. P-P match														
2. Income	-0.02													
3. Total spend	-0.04	0.76												
4. Gender	-0.04	-0.07	-0.09											
5. Age	-0.03	0.28	0.33	-0.13										
6. Person O	-0.02	-0.03	-0.02	0.02	0.00									
7. Person C	-0.06	0.06	0.07	0.04	0.14	0.04								
8. Person E	0.07	0.04	0.05	0.13	0.00	0.06	0.12							
9. Person A	0.13	0.01	0.03	-0.01	0.04	-0.01	0.19	0.14						
10. Person N	-0.06	-0.10	-0.13	0.21	-0.16	0.00	-0.25	-0.31	-0.22					
11. Basket O	-0.05	-0.03	-0.04	-0.02	-0.09	0.01	-0.01	0.00	0.00	0.01				
12. Basket C	0.10	0.05	0.07	0.01	0.09	0.00	0.02	0.00	0.01	-0.02	-0.41			
13. Basket E	-0.01	-0.03	-0.04	-0.03	-0.08	0.01	-0.01	0.01	-0.01	0.01	0.73	-0.66		
14. Basket A	0.10	-0.03	-0.03	0.06	-0.02	0.00	0.01	0.00	0.02	0.01	0.18	0.30	-0.17	
15. Basket N	-0.14	-0.02	-0.02	-0.04	-0.05	0.01	-0.01	0.00	-0.02	0.01	0.39	-0.77	0.74	-0.65

Table S2. Zero order correlations between predictors in multiple linear regression analyses (Hypothesis 2). N = 625. All correlations > |0.065| are significant.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. B-P match															
2. Income	-0.05														
3. Total spend	-0.04	0.75													
4. Gender	-0.03	-0.10	-0.11												
5. Age	0.12	0.29	0.33	-0.13											
6. Person O	0.11	-0.04	-0.03	0.01	0.00										
7. Person C	0.02	0.06	0.06	0.02	0.13	0.05									
8. Person E	0.03	0.03	0.05	0.12	0.01	0.07	0.12								
9. Person A	-0.10	0.00	0.02	-0.03	0.03	-0.03	0.18	0.14							
10. Person N	0.00	-0.10	-0.14	0.21	-0.14	-0.01	-0.26	-0.30	-0.23						
11. Extremity	0.47	-0.01	0.01	0.12	-0.01	0.10	0.06	-0.01	-0.06	0.05					
12. Basket O	-0.15	-0.17	-0.16	-0.10	-0.41	0.05	-0.05	-0.01	-0.01	0.05	0.03				
13. Basket C	0.08	0.24	0.29	0.04	0.41	-0.04	0.09	0.00	0.06	-0.10	0.03	-0.53			
14. Basket E	-0.12	-0.15	-0.16	-0.16	-0.39	0.06	-0.04	0.03	-0.03	0.05	-0.02	0.82	-0.71		
15. Basket A	-0.16	-0.14	-0.12	0.26	-0.10	-0.02	0.04	0.03	0.05	0.02	0.06	0.20	0.24	-0.10	
16. Basket N	0.02	-0.06	-0.07	-0.18	-0.21	0.05	-0.05	-0.02	-0.07	0.04	-0.04	0.39	-0.75	0.69	-0.68

Table S3. Raw means and standard deviations of positive affect across the four assessments T1-T4

Participants	Product	T1		T2		T3		T4	
		mean	SD	mean	SD	mean	SD	mean	SD
Extroverted	Extroverted	32.74	7.47	35.89	7.95	34.21	6.77	33.74	8.75
Extroverted	Introverted	31.06	8.06	32.00	8.36	34.06	9.77	31.20	8.26
Introverted	Extroverted	32.35	8.10	30.65	8.35	32.94	7.47	30.76	7.79
Introverted	Introverted	27.65	7.59	31.83	7.63	32.74	9.49	32.00	9.11

Table S4. Results of linear regression analyses of the predictors “participant personality” (introverted = 0, extraverted = 1) and “product personality” (introverted = 0, extraverted = 1) on the three Happiness measures “Happiness T1: Anticipation” (N = 79), “Happiness T2: Spending” (N = 75) and “Happiness T3: Consumption” (N = 72). * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Predictors	Happiness T2		
	b	CI ₉₅	t
Participant personality	-10.60***	-16.28 – -4.92	-3.72
Product personality	-13.03***	-18.58 – -7.47	-4.67
Participant personality × product personality	7.70***	4.12 – 11.28	4.29
Happiness T1	.90***	.79 – 1.02	15.41
Predictors	Happiness T3		
	b	CI ₉₅	t
Participant personality	-4.84	-13.78 – 4.11	-1.08
Product personality	-8.39	-17.36 – .58	-1.87
Participant personality × product personality	3.55	-2.13 – 9.24	1.25
Happiness T1	.79***	.60 – .98	8.39
Predictors	Happiness T4		
	b	CI ₉₅	t
Participant personality	-10.70*	-20.11 – -1.28	-2.27
Product personality	-13.44**	-22.77 – -4.11	-2.87
Participant personality × product personality	7.32*	1.37 – 13.27	2.45
Happiness T1	.77***	.57 – .96	7.856

A – Replication of Study 1 and Study 2 with discretionary spending only

In order to distinguish between discretionary and essential spending categories, we asked 200 workers on Amazon Mechanical Turk to rate the categories on a 5-point scale. Participants were given the following instructions: “We are interested in whether you think the following spending categories are 'Essential' or 'Discretionary' (not essential). An essential purchase is one that is required to live. A discretionary purchase is one that is not required to live or is more expensive than necessary. Some purchases are in-between. For each spending category please rate them from 1 = essential to 5 = discretionary”. The points of the scale were further specified with the following descriptions. 1 = Only Essential: Required to live comfortably. 2 = Mostly Essential: Mostly required for a comfortable living but somewhat discretionary. 3 = Equally Essential and Discretionary. 4 = Mostly Discretionary: Mostly discretionary but somewhat required to live comfortably. 5 = Only Discretionary: Not required to live comfortably. Each participant rated 30 categories that were randomly assigned to them. On average each category was rated 100 times (min = 91, max = 110).

In a first step, we classified all of the spending categories into discretionary vs. essential. A category was classified as “discretionary” if its average rating was 3 or higher. 48 categories out of 59 (81%) were classified as discretionary. Table S5 displays the average ratings and dichotomous classification for each category. In a second step we repeated the analyses of studies 1 and 2 with the reduced dataset of discretionary spending only. The results are displayed in Table S6 and S7 respectively. The results did not diverge substantially from the findings of our main analysis.

Table S5. Average discretionary ratings and dichotomous classification of all 59 spending categories.

(Continued)					
Category	Discretionary Rating	Discretionary Classification	Category	Discretionary Rating	Discretionary Classification
Accountants' fees	3.23	1	Gardening	3.21	1
Advertising services	4.00	1	Gift shops	4.45	1
Airports & duty free	3.68	1	Hair & beauty	3.48	1
Arts & crafts	3.99	1	Hardware	2.75	0
Bakers & confectioners	3.92	1	Health & fitness	2.34	0
Books	3.10	1	Health insurance	1.89	0
Cable & satellite TV	3.93	1	Home furnishing	2.72	0
Car hire	3.77	1	Home insurance	2.17	0
Caravans & camping	4.32	1	Hotels	3.72	1
Catalogue & bargain stores	3.44	1	Jewelry	4.49	1
Charities	3.81	1	Life assurance	2.63	0
Cinema	4.38	1	Mobile telephone	3.48	1
Clothes	1.56	0	Motor sports	4.61	1
Coffee shops	4.12	1	Music	3.46	1
Computers & technology	3.13	1	Newsagents	3.77	1

Confectioners & tobacconists	4.49	1	Pets	3.55	1
Days out & tourism	4.35	1	Photography	4.05	1
Dental care	1.76	0	Residential mortgages	2.31	0
Department stores	3.13	1	Shoe shops	3.13	1
Digital	3.47	1	Sports	4.12	1
Discount stores	3.31	1	Stationery	3.35	1
DIY	3.10	1	Subscriptions	4.22	1
Eating out – pubs	4.15	1	Supermarkets	1.74	0
Eating out – restaurants	3.77	1	Takeaways	3.85	1
Electronic commerce & IT	3.31	1	Toys & hobbies	3.94	1
Entertainment	3.92	1	Traffic fines	3.09	1
Family clothes	1.71	0	Travel	3.76	1
Florists	4.40	1	TV license	4.01	1
Foreign travel	4.48	1	Unions & subscriptions	3.32	1
Gambling	4.76	1			

Table S6. Hierarchical linear model with logged amount as outcome. The analysis is based on 8,943 observations from 625 participants. *b* = unstandardized coefficients. Pseudo-R² = 0.07 (correlation of fitted vs. observed values). * $p < .05$, ** $p < .01$, *** $p < .001$.

Predictors	Model 1			Model 2		
	<i>b</i>	<i>CI</i> ₉₅	<i>t</i>	<i>b</i>	<i>CI</i> ₉₅	<i>t</i>
P-P-match	.06***	.04 – .09	4.44	.03	-.003 – .06	1.92
Income (log)	.06	.002 – .13	1.82	.05	-.002 – .11	1.65
Total spend (log)	.31***	.24 – .37	9.45	.30***	.24 – .36	9.44
Gender	.10**	.03 – .16	3.00	.04	-.03 – .10	1.19
Age	.01***	.003 – .008	4.33	.01***	.004 – .009	4.80
Person-O				.004	-.02 – .03	.25
Person-C				.01	-.02 – .04	.64
Person-E				-.02	-.05 – .02	-1.17
Person-A				-.02	-.05 – .01	-1.33
Person-N				-.02	-.05 – .01	-1.04
Product-O				-.14***	-.19 – -.08	-4.81
Product-C				.12***	.08 – .19	5.29
Product-E				.75***	.68 – .82	20.23
Product-A				-.42***	-.48 – -.35	-12.87
Product-N				-.50***	-.60 – -.41	-10.34
Pseudo-R ²		.07			.13	

Table S7. Multiple linear regression analysis of life satisfaction on “basket–person match” and controls (625 observations). * $p < .05$, ** $p < .01$, *** $p < .001$.

Predictors	Model 1			Model 2		
	b	CI ₉₅	t	b	CI ₉₅	t
B-P-match	.08*	.01 – .13	2.36	.07*	.002 – .13	2.02
Income (log)	.02	-.11 – .16	.37	.05	-.08 – .17	.44
Total spend (log)	.06	-.07 – .19	.94	.01	-.12 – .14	.89
Gender	.02	-.11 – .16	.35	.01	-.14 – .16	.92
Age	-.01*	-.01 – -.001	-2.04	-.01**	-.01 – -.003	-2.88
Person-O				.04	-.02 – .10	1.29
Person-C				-.003	-.07 – .07	-.07
Person-E				.08	.01 – .15	2.38*
Person-A				.01	-.06 – .07	.20
Person-N				-.23***	-.30 – -.15	-6.14
Extremity				.07	-.16 – .29	.59
Basket-O				-.13*	-.24 – -.02	-2.43
Basket-C				.08	-.04 – .19	1.28
Basket-E				.12	-.02 – .26	1.69
Basket-A				.15*	.01 – .30	2.02
Basket-N				.10	-.12 – .32	.91
Adjusted R ²		.01			.11	

