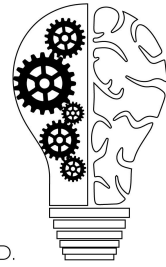


Episode 101: The Big Five: Extraversion

Ryan Holas, B.S., Adriana Alvarez, B.S., Karl Wallenkampf, M.A., Kyle Logan, B.S., David Puder, M.D.

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Introduction

We are examining the facets of the most studied personality model, the Big Five. The facets are as follows:

1. Neuroticism: negative emotionality associated with a proclivity to anxiety, anger, irritability, and emotional pain.
2. Openness to experience: the combination of interest and ideas known as intellect. Associated interest in aesthetics. Enjoyment in ideas and spending time in creative pursuits.
3. Conscientiousness: central to orderliness and industrialism. A good predictor of long-term life success, especially in academic attainment. Focus of energy on attention to detail and responsibility.
4. Agreeableness: compassion, politeness, maternal in orientation (those who often care about others more than themselves), cooperative more than competitive. Prone to be taken advantage of and harbor resentment ([DeYoung et al., 2007](#)).
5. Today we are going to focus on extraversion, the positive emotion dimension associated with gregariousness, charisma, enthusiasm, assertiveness, and social ability.

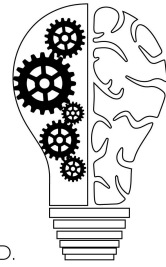
Facets of extraversion

Warmth

“Warmth is the facet of extraversion most relevant to issues of interpersonal intimacy. Warm people are affectionate and friendly. They genuinely like people and easily form close attachments to others. Low scorers are neither hostile nor necessarily lacking in compassion, but they are more formal, reserved, and distant in manner than high scorers” ([Piedmont, 1998](#)).

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E1: Warmth	Low	High
Definition	<ul style="list-style-type: none"> • Does not enjoy chatting with others • Can be perceived as cold and distant 	<ul style="list-style-type: none"> • Smiles easily • Strong emotional attachments to friends • Enjoys talking to others • Likes most people they meet • Takes a personal interest in others
Strengths	<ul style="list-style-type: none"> • Does not hastily invest in nonreciprocal relationships 	<ul style="list-style-type: none"> • Warm and friendly

Gregariousness

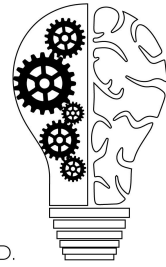
“Gregarious people enjoy the company of others, the more the merrier.

Low scorers on this scale tend to be loners who do not seek – or who even actively avoid – social stimulation” ([Piedmont, 1998](#)).

E2: Gregariousness	Low	High
Definition	<ul style="list-style-type: none"> • Prefers working in solitude • Shies away from crowds • Finds social gatherings boring 	<ul style="list-style-type: none"> • Likes to be around multiple people • Enjoys vacationing at popular beaches • Yearns for others if alone for too long
Strengths	<ul style="list-style-type: none"> • Can benefit from quiet contemplation and intentional alone time 	<ul style="list-style-type: none"> • Can bring a refreshing energy to a room

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A lot of people that are high in gregariousness suffer more in times of required solitude such as required studying or the lockdowns of COVID-19 season. They have a hunger to interact with other people. This can be intense for psychiatrists if their patient happens to be high in this category because they can feel that intense yearning for human interaction.

If you have two clients who are strongly mismatched in this area, how do you help accept them each other for where they are at? Finding out how to work with each other's needs is important in the relationship. Perhaps the introvert can be accommodating to the extrovert's desire for a large group of people during special events such as birthdays, while the extrovert would be willing to hang out with just a few friends on a regular basis so they both have their desires met.

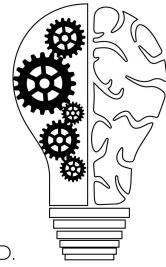
Assertiveness

“High scorers on this facet are dominant, forceful, and socially ascendant. They speak without hesitation and often become group leaders. Low scorers prefer to keep in the background and let others do the talking” ([Piedmont, 1998](#)).

E3: Assertiveness	Low	High
Definition	<ul style="list-style-type: none">• Has a difficult time taking charge• Lets others talk before speaking up• Has a difficult time standing up for themselves	<ul style="list-style-type: none">• Dominant, forceful, assertive• Tends to do most of the talking in conversation
Strengths	<ul style="list-style-type: none">• Does not need to follow another person in order to be confident in their choices	<ul style="list-style-type: none">• Often labeled as a leader• Confident in making decisions

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Activity

“A high activity score is seen in rapid tempo and vigorous movement, a sense of energy, and a need to keep busy. Active people lead fast-paced lives. Low scorers are more leisurely and relaxed in tempo, although they are not necessarily sluggish or lazy” ([Piedmont, 1998](#)).

E4: Activity	Low	High
Definition	<ul style="list-style-type: none">• Not as quick and lively as others• Slow and steady work habits	<ul style="list-style-type: none">• Lives a fast-paced life• Active• Acts forcefully and energetically
Strengths	<ul style="list-style-type: none">• Laidback	<ul style="list-style-type: none">• Productive

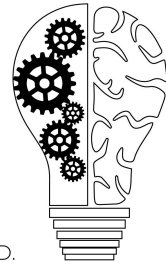
Excitement-seeking

“High scorers on this scale crave excitement and stimulation. They like bright colors and noisy environments. Excitement-seeking is akin to some aspects of sensation seeking. Low scorers feel little need for thrills and prefer a lifestyle that high scorers might find boring” ([Piedmont, 1998](#)).

E5: Excitement-seeking	Low	High
Definition	<ul style="list-style-type: none">• Does not enjoy vacationing in busy and flashy areas• Avoids horror films	<ul style="list-style-type: none">• Craves excitement• Enjoys doing things just for the heck of it• Likes loud music• Enjoys sporting events
Strengths	<ul style="list-style-type: none">• Level-headed; provides a calm nature to relationships	<ul style="list-style-type: none">• Can bring excitement and fun into group settings and parties

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Positive Emotions

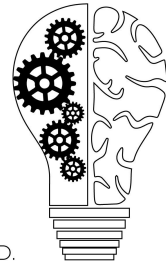
“The last facet of extraversion assesses the tendency to experience positive emotions such as joy, happiness, love, and excitement. High scorers laugh easily and often. They are cheerful and optimistic. Low scorers are not necessarily unhappy; they are merely less exuberant and high-spirited” ([Piedmont, 1998](#)).

E6: Positive Emotions	Low	High
Definition	<ul style="list-style-type: none">• Does not outwardly display joy or excitement• Does not use words like “fantastic!” or “amazing!”• Does not consider themselves happy-go-lucky	<ul style="list-style-type: none">• Feels joy in their body• Bubbly• Cheerful optimistic• Laughs easily
Strengths	<ul style="list-style-type: none">• Can be realistic about potential endeavors and disappointments	<ul style="list-style-type: none">• Cheerful and high spirited

Fighting against jadedness as a resident is an important aspect of helping patients. If you don’t believe your patient can improve it will be harder to help them improve. Many residents will only see frequent visitors to the hospital but don’t see the progress they make outside of the hospital walls. One example that comes to mind was a manic, homeless patient who would get white supremacy tattoos while in his bipolar manic phases. But, now he’s had his tattoos removed, is married to a woman of color and he is raising biracial children. Feeling hope for people and their outcome helps mental health professionals get through the darker aspects of people and their character. It’s the optimism that is necessary for the change to occur.

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Our scores

Puder

Extraversion Facets			
(E1) Warmth	28	67	Very High
(E2) Gregariousness	25	69	Very High
(E3) Assertiveness	20	57	High
(E4) Activity	23	63	High
(E5) Excitement-Seeking	15	44	Low
(E6) Positive Emotions	26	66	Very High

Holas

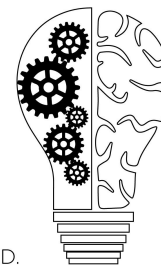
Extraversion Facets			
(E1) Warmth	25	60	High
(E2) Gregariousness	22	63	High
(E3) Assertiveness	13	42	Low
(E4) Activity	8	27	Very Low
(E5) Excitement-Seeking	25	64	High
(E6) Positive Emotions	27	68	Very High

Alvarez

Extraversion Facets			
(E1) Warmth	30	66	Very High
(E2) Gregariousness	29	72	Very High
(E3) Assertiveness	23	65	High
(E4) Activity	24	64	High
(E5) Excitement-Seeking	27	70	Very High
(E6) Positive Emotions	29	66	Very High

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Logan

Extraversion Facets			
(E1) Warmth	23	55	Average
(E2) Gregariousness	18	55	Average
(E3) Assertiveness	14	44	Low
(E4) Activity	19	54	Average
(E5) Excitement-Seeking	18	50	Average
(E6) Positive Emotions	21	55	Average

Wallenkampf

Extraversion Facets			
(E1) Warmth	27	64	High
(E2) Gregariousness	18	55	Average
(E3) Assertiveness	29	76	Very High
(E4) Activity	17	49	Average
(E5) Excitement-Seeking	19	52	Average
(E6) Positive Emotions	25	64	High

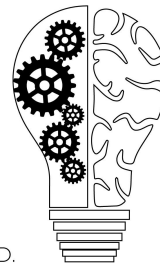
Extraversion over the lifespan

The majority of longitudinal and cross-sectional studies show extraversion as a whole decreases with age.

A large cross-sectional study found extraversion decreasing with age in 2 different populations. The British Household Panel Study with 14,039 participants found a linear decrease in extraversion across the lifespan with a difference of 7.60 T units between the youngest (16 years old) and oldest (86 years old) group of participants. A similar pattern was seen in the German Socio-Economic Panel Study with 20,852 participants with a difference of 3.64 T units between the youngest and oldest group of participants ([Donnellan & Lucas, 2008](#)).

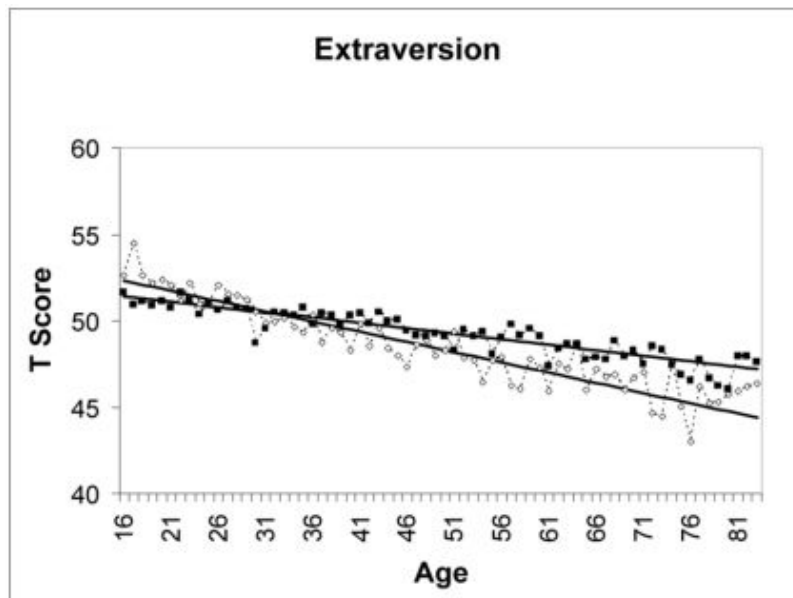
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“Figure 1. Age Differences in the Big Five” from [\(Donnellan & Lucas, 2008\)](#)

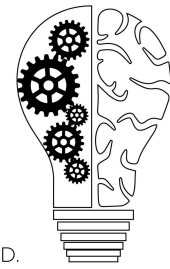
In 2006, one of the largest meta-analyses of longitudinal personality change was done using 92 studies with 50,120 participants. This meta-analysis used a modified version of the Big Five that split extraversion into social vitality and social dominance to increase the number of studies included. Social dominance was equivalent to assertiveness whereas social vitality was roughly equivalent to warmth, gregariousness, activity, and positive emotions [\(Roberts et al., 2006\)](#).

The meta-analysis showed social dominance increased throughout the lifespan up to the age of 40, then plateaus. Cumulatively, the increase in assertiveness was over one standard deviation. Significant increases were seen in adolescence ($d = .20$), in college ($d = .41$), from 20 years old to 30 years old ($d = .28$), and from 30 years old to 40 years old ($d = .18$). Social vitality increased during college ($d = .06$), decreased from 22 years old to 30 years old ($d = -.14$), and decreased from 60 years old to 70 years old ($d = -.16$) [\(Roberts et al., 2006\)](#).

This is an assertiveness that comes with competence. Medical professionals who have been in their field for several years are more confident than when they were as a resident. The reverse scenario would result in an overconfident person operating as if they know more than they do. Sometimes the most dangerous professionals are those who don't know what they don't know.

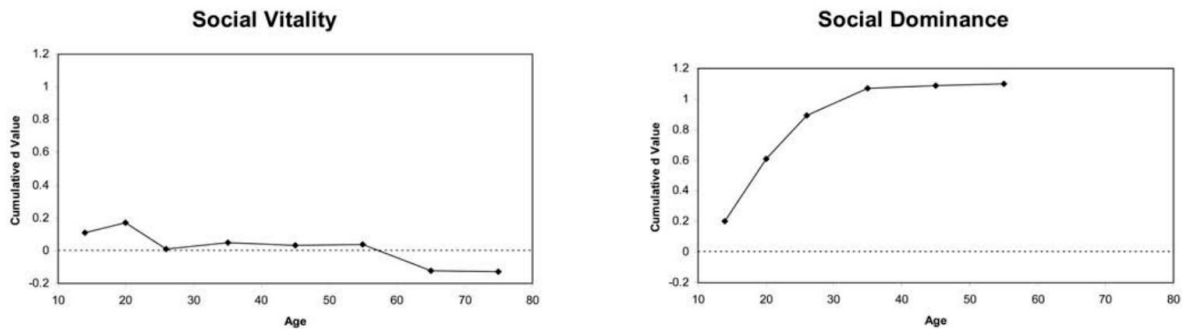
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As you gain more experience, you realize what you do and don't know, resulting in more confidence in what you do know.

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“Figure 2. Cumulative d scores for each trait domain across the life course” from [\(Roberts et al., 2006\)](#)

Gender did not have a correlation with mean-level personality changes in social dominance. This study did not observe Guttman’s crossover hypothesis, which is that women increase in social dominance more than men do as they age, and men increase in agreeableness more than women do as they age [\(Roberts et al., 2006\)](#).

Trait	<i>K</i>	Gender	Time	Cohort	Attrition	<i>Q_E</i>
Social vitality	76	.0308	-.0135**	-.0066	.0000	198.7**
Social dominance	31	.0470	-.0027	.1183**	.0043	22.1
Agreeableness	62	-.0736	.0204**	.0676**	.0002	127.3**
Conscientiousness	65	-.0147	.0183**	.0420**	.0028	169.5**
Emotional stability	102	-.0025	.0037	.0164	.0010	174.4**
Openness to experience	66	.0506	.0070	.0527	-.0021	371.7**

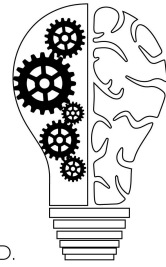
Note. Coefficients are unstandardized beta weights in the metric of the standardized mean-level difference scores. *K* = number of samples; *Q_E* = test for residual heterogeneity after accounting the effect for moderators. ** *p* < .01.

“Table 10. Moderators of Personality Trait Development Across the Life Course.” from [\(Roberts et al., 2006\)](#)

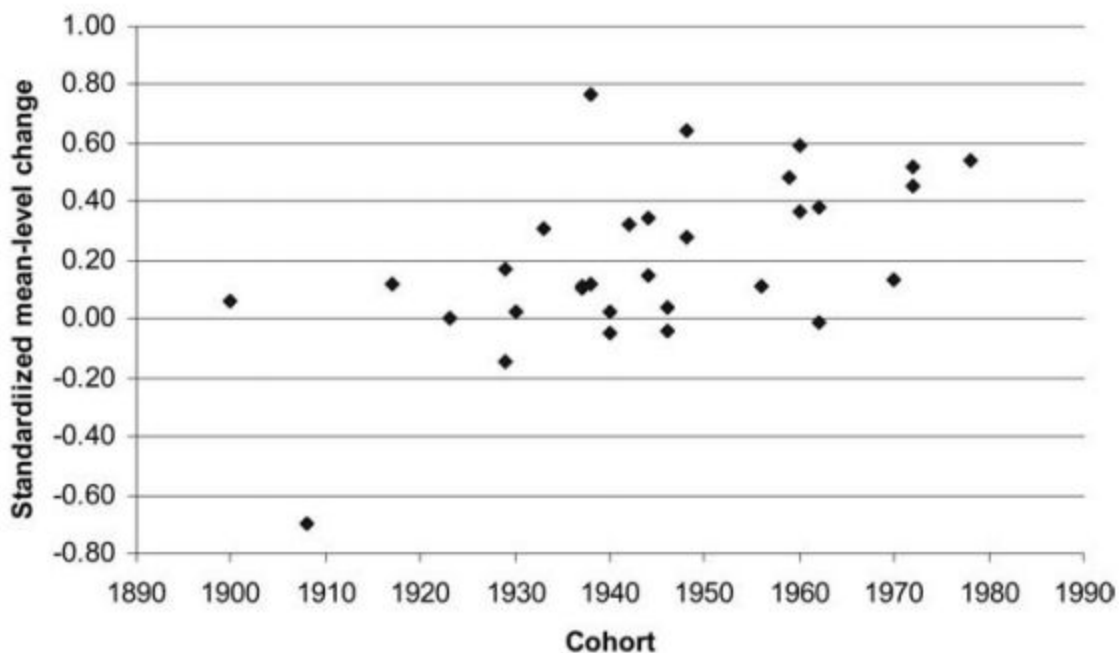
Another interesting finding is that younger cohorts were observed to have increased levels of social dominance compared to older cohorts [\(Roberts et al., 2006\)](#).

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“Figure 4. Bivariate plot of standardized mean-level change in social dominance and cohort.”
from [\(Roberts et al., 2006\)](#)

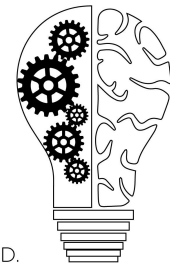
What is the neurological basis of extraversion?

Neuroanatomy and extraversion

Here, we look at a test-retest study by [Li et al. \(2019\)](#) where an MRI and the Revised NEO Personality Inventory were taken two years apart. Initially, $n=382$ and at the follow up two years later $n=133$. In both studies, extraversion had significant positive associations with gray matter volume of the left caudate nucleus body ($T=4.13$ at the first time point, $T=4.30$ at the second time point). This area participates in the brain's dopaminergic reward system. Of the facets of extraversion, gregariousness and excitement seeking were the biggest mediators of the gray matter volume-extraversion association. This suggests the caudate nucleus may be related to sensitivity to rewards, as well as a critical structure underlying extraverted behaviors.

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This study supports the Reward-Sensitivity-as-Core Model. [Lucas et al. \(2000\)](#) explain this model as the idea that each facet of extraversion is a direct manifestation of a positive incentive motivational system. Sensitivity to rewards is found in extraversion traits such as assertiveness, sociability, and talkativeness. This suggests the core of extraversion could be a reward sensitivity construct.

Extraversion and the somatosensory response

[Schaefer et al. \(2012\)](#) explore the theory that the behavioral differences between extraverts and introverts can be explained by overactive cortical activity in introverts requiring constant compensation. Activity in the primary somatosensory cortex was measured in response to nonpainful tactile stimulation (n=23) and they assessed personality with the Five-Factor Model. Neuromagnetic source imaging revealed that the less extraverted the participants were, the higher cortical activity found in the primary somatosensory cortex in response to the non-painful tactile stimulation (effect size = -0.66). This relationship was particularly valid for the right hemisphere.

How do people high in extraversion act in relationships?

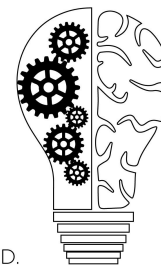
Extraversion in social relationship satisfaction

[Tov et al. \(2016\)](#) examined extraversion and relationship satisfaction in college students. In both studies, participants completed a personality test and recorded relationship satisfaction. In the first study of 206 participants, relationship satisfaction was recorded daily for 3 weeks and found extraversion correlated with family satisfaction ($r = 0.22$), friends satisfaction ($r = 0.33$), and romantic life satisfaction ($r = 0.19$). The second study recorded relationship satisfaction bi-weekly for 2 months and found extraversion correlated with friends satisfaction ($r = 0.26$) and romantic life satisfaction ($r = 0.31$) ([Tov et al., 2016](#)).

0.31 is not a huge correlation, but it's there. You always hear people saying that they want a partner who is outgoing, does fun things and wants to explore the world. Those are all extraversion ideals of that person.

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Table 1 Studies 1 and 2: Correlations, Means, and Standard Deviations for Personality and Satisfaction

Variables	1	2	3	4	5	6	7	8	9
1. IPIP Agreeableness	—	.22*	-.21*	.60*	.33*	-.30*	.28*	.34*	.16
2. IPIP Extraversion	.39*	—	-.41*	.17*	.73*	-.44*	.08	.26*	.31*
3. IPIP Neuroticism	-.21*	-.18*	—	-.37*	-.46*	.76*	-.14	-.39*	-.23*
4. Q-Set Agreeableness	.66*	.29*	-.42*	—	.31*	-.47*	.29*	.37*	.26*
5. Q-Set Extraversion	.49*	.70*	-.29*	.52*	—	-.59*	.20*	.37*	.39*
6. Q-Set Neuroticism	-.30*	-.31*	.78*	-.57*	-.57*	—	-.25*	-.41*	-.23*
7. Family satisfaction	.32*	.22*	-.23*	.29*	.29*	-.30*	—	.57*	.19*
8. Friends satisfaction	.35*	.33*	-.38*	.34*	.43*	-.48*	.72*	—	.35*
9. Romantic life satisfaction	.15*	.19*	-.21*	.22*	.30*	-.28*	.40*	.45*	—
	Study 1								
M	69.00	50.73	50.55	58.34	61.03	42.78	62.77	63.16	49.85
SD	14.04	17.89	20.72	11.25	11.33	11.43	15.08	13.68	21.24
	Study 2								
M	69.77	51.33	49.06	59.37	60.95	42.80	67.98	66.45	53.70
SD	13.19	19.40	19.50	10.57	10.35	10.76	13.86	13.74	21.37

Note. $N = 206$ for Study 1; $N = 139$ for Study 2. IPIP = International Personality Item Pool; Q-Set = Q-Set Measure of Five-Factor Model (McCrae et al., 1986). Correlation for Study 1 variables appear below the diagonal; Study 2 variables appear above the diagonal. Responses were rescaled to range from 0 to 100 prior to computing the means.

* $p < .05$.

“Table 1. Studies 1 and 2: Correlations, Means, and Standard Deviations for Personality and Satisfaction” ([Tov et al., 2016](#))

A meta-analysis done by [Heller et al. \(2004\)](#) looked at the relationship between personality and satisfaction in the domains of job, marriage, and overall life satisfaction. Their results found sizeable coefficients linking extraversion to both job (Table 4; Avg $r = 0.19$) and marital satisfaction (Table 5; Avg $r = 0.14$). Extraversion also correlated with life satisfaction (Table 8; Avg $r = 0.28$) ([Heller et al., 2004](#)).

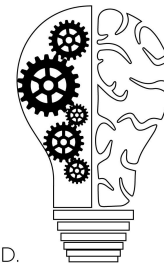
Table 4
Association Between the Big Five and Job Satisfaction

Trait	K	N	Avg. r	ρ	CV	CL
Neuroticism	92	24,527	-.24	-.29	-.50, -.08	-.33, -.26
Extraversion	75	20,184	.19	.25	.06, .45	.22, .29
Openness	50	15,196	.01	.02	-.26, .29	-.05, .08
Agreeableness	38	11,856	.13	.17	-.03, .37	.12, .22
Conscientiousness	79	21,719	.20	.26	-.02, .55	.21, .31

Note. From “Personality and Job Satisfaction: A Meta-Analysis,” by T. A. Judge, D. Heller, and M. K. Mount, 2002, *Journal of Applied Psychology*, 78, p. 533. Copyright 2002 by the American Psychological Association. Avg. = average; CV = 10% and 90% credibility values; CL = 5% and 95% confidence limits.

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“Table 4. Association Between the Big Five and Job Satisfaction” from ([Heller et al., 2004](#)).

Table 5
Association Between the Big Five and Marital Satisfaction

Trait	K	N	Avg. r	ρ	CV	CL
Neuroticism	40	7,640	-.26	-.29	-.51, -.08	-.35, -.24
Extraversion	22	3,372	.14	.17	.11, .23	.13, .21
Openness	5	1,154	.08	.10	.10, .10	.04, .16
Agreeableness	19	3,071	.24	.29	.29, .29	.25, .32
Conscientiousness	6	1,201	.22	.25	.25, .25	.20, .31

Note. Avg. = average; CV = 10% and 90% credibility values; CL = 5% and 95% confidence limits.

“Table 5. Association Between the Big Five and Marital Satisfaction” from ([Heller et al., 2004](#)).

Table 8
Association Between the Big Five and Life Satisfaction

Trait	K	N	Avg. r	ρ	CV	CL
Neuroticism	19	12,092	-.48	-.56	-.63, -.49	-.58, -.53
Extraversion	19	12,092	.28	.34	.26, .41	.30, .37
Openness	19	12,092	.08	.10	.06, .13	.08, .12
Agreeableness	19	12,092	.29	.35	.29, .41	.32, .38
Conscientiousness	19	12,092	.31	.36	.30, .43	.33, .39

Note. Avg. = average; CV = 10% and 90% credibility values; CL = 5% and 95% confidence limits.

“Table 8. Association Between the Big Five and Life Satisfaction” from ([Heller et al., 2004](#)).

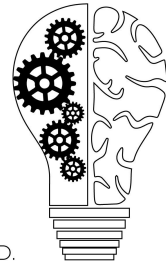
Extraversion mediates followers’ behavior around leadership

Monzani et al. did a study in [2014](#) examining extraversion and preference between the two leadership styles, authentic and transactional. The authentic leadership style focuses on relationship building, whereas the transactional leadership style relies on compliance through rewards and punishments. In this study, they found that authentic leadership gained the most loyalty from followers. Highly extraverted people were less loyal to leaders in general (B = -0.18) but preferred the authentic leadership style (B = 0.37)([Monzani et al., 2014](#)).

There’s a strong preference towards the relational leader. Someone who is willing to engage on a personal level. It’s interesting that some companies have management courses that discourage making friends with people who work under them to be “fair.” At the end of the day, if a leader cannot be relational with the people that they work with, it seems less desirable.

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	β	ΔR^2
<i>Step 1</i>		.54***
Age	-.08	
Biological gender	-.02	
Work experience	.04	
Openness	-.04	
Emotional stability	.01	
Conscientiousness	-.02	
Followers' Loyalty T1	.74***	
<i>Step 2</i>		.16
Leadership style	.08	
Extraversion	-.06	
Agreeableness	.04	
<i>Step 3</i>		.02**
Leadership style \times Extraversion	.16**	
Leadership style \times Agreeableness	-.16**	

Note: * $p < .05$, ** $p < .01$, *** $p < .0001$

“Table 2. Hierarchical regression analysis for variables predicting loyalty to the leader at Work session 2 (N = 224)” from ([Monzani et al., 2014](#)).

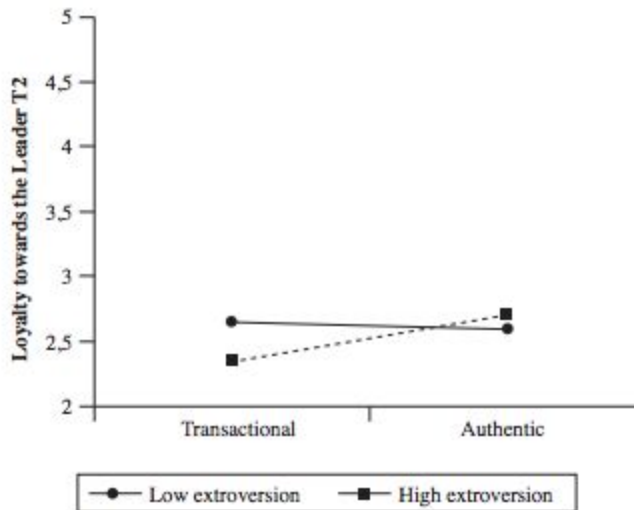
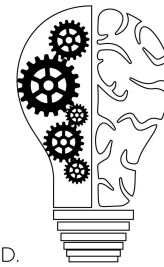


Figure 2. Interaction effect: Leadership style and Extraversion

“Figure 2. Interaction effect: Leadership style and Extraversion” from ([Monzani et al., 2014](#)).

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What are the advantages of being extraverted?

Personal experience

Extraversion and life satisfaction

Foundationally, how does extraversion affect life satisfaction? [Kim et al. \(2018\)](#) sought to find an answer in data from Canada, the United States, the United Kingdom, Germany, and Japan. As their premise, they noted how life satisfaction may interplay with personality in the person-environment fit theory of a person's vocational fit between environment and personality. They argued further that well being is improved by personality if the environment is rewarding, and that personality can improve well-being the most if a situation is conducive to a personality type ([Kim et al., 2018, para 9](#)). Kim et al. criticize previous studies that correlated extraversion and life satisfaction for having small correlation sizes around an r of 0.25-0.35 ([Kim et al., 2018, para 3](#)). They noted weaknesses of using student samples alone, or self-ratings for both personality and life satisfaction, and sought to improve statistical methods in their study.

Their five studies consistently showed an effect size of 0.2 related to extraversion and life satisfaction. They reproduced the finding that low neuroticism carries the highest effect size (usually ~ 0.4) in improving life satisfaction, often twice as much as extraversion. Interestingly, the effect size of extraversion on life satisfaction varied with nationality. In the US, effect size was consistently around 0.2. However, though extraversion and life satisfaction were linked in German (0.078), British (0.126), and Japanese (0.153) survey respondents, the effect sizes were much smaller.

TABLE 6 Regression coefficients and standard errors

	North America (UTM)		North America (MIDUS)		North America (Study 5)		Japan		Britain		Germany	
	a	b	a	b	a	b	a	b	a	b	a	b
Neuroticism	-.213 (.031)	-.221 (.031)	-.334 (.017)	-.340 (.017)	-.523 (.042)	-.547 (.042)	-.441 (.034)	-.437 (.035)	-.365 (.010)	-.346 (.010)	-.395 (.012)	-.452 (.013)
Extraversion	.232 (.032)	.232 (.032)	.279 (.020)	.225 (.019)	.207 (.044)	.217 (.046)	.166 (.046)	.153 (.042)	.122 (.012)	.126 (.012)	.074 (.016)	.078 (.016)
Openness	-.056 (.034)	-.060 (.034)	-.119 (.019)	-.103 (.020)	-.225 (.060)	-.271 (.065)	.013 (.054)	.022 (.053)	-.065 (.013)	-.065 (.013)	.067 (.017)	.085 (.018)
Agreeableness	.076 (.034)	.087 (.034)	.016 (.020)	-.069 (.020)	-.031 (.051)	-.046 (.053)	.198 (.037)	.183 (.036)	.048 (.014)	.125 (.013)	.049 (.012)	.051 (.013)
Conscientiousness	.177 (.033)	.155 (.033)	.255 (.021)	.302 (.020)	.202 (.058)	.203 (.059)	.010 (.054)	.023 (.053)	.120 (.014)	.099 (.012)	.004 (.013)	-.071 (.014)

Note. UTM = University of Toronto Mississauga; MIDUS = National Survey of Midlife Development in the United States.

^aNumbers represent regression coefficients without the secondary loadings.

^bNumbers represent regression coefficients with the secondary loadings.

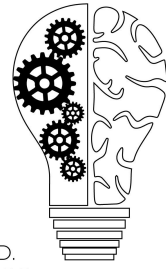
"Table 6. Regression coefficients and standard errors" from ([Kim et al., 2018](#)).

[Kim et al. \(2018\)](#) concluded that extraversion is linked to life satisfaction, but suggests a significant cultural impact linked to individualism and residential mobility. People in the US tend

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to be very residentially mobile and individualistic, requiring social networking for social ascendency. In such cultures, they suggest, greater extraversion may thus result in greater life satisfaction, while in other cultures the lesser residential mobility may not reward extraversion as much--even if individualistic (consider Germany).



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Employment/healthcare

Social relationships are an important way that personality shapes our experience, but one of the most important places where personality traits affect our lives is in our place of employment. We begin with a discussion of how some trainees may experience the effect of their personality, then transition to one of the most central health professions--nursing, and conclude with how physical states may modulate personality in the workplace.

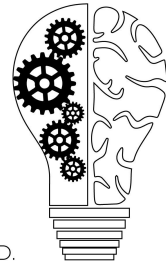
Trainees

First, the performance of trainees can be partially informed by a study by [Schreckenbach et al. \(2018\)](#) on 245 fourth-year medical students. The students' personalities were assessed using an abbreviated Big Five Inventory, then they took an emotion recognition test called the Diagnostic Analysis of Nonverbal Accuracy-2, Adult Facial Expressions. The students were then placed in a surgical objective structured clinical examination (OSCE), a standardized test in which students are tasked with demonstrating their rapport-building, clinical assessment abilities, and patient education and question-answering with a standardized patient (actor).

Schreckenbach et al. had the standardized patients assess each student's empathetic communication using the brief Consultation and Relational Empathy (CARE) scale. Schreckenbach and her colleagues found that while the student's emotion recognition and extraversion were not associated with standardized patient's perception of student empathetic communication, a regression model in which emotion recognition and extraversion were linked found that students who were both high in emotion recognition and extraversion were rated higher on empathetic communication than their low-extraversion peers.

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Table 3

Parameter estimates for crossed random effects model of student empathic behavior (judged by simulated patients) depending on students' emotion recognition and extraversion

Fixed effects	Estimate	SE	t	p
Intercept	3.85	0.14	27.62	<0.001**
Emotion Recognition (ER)	<0.01	0.01	0.14	0.889
Extraversion	0.02	0.04	0.64	0.523
ER x Extraversion	0.03	0.01	2.32	0.021*
<i>Control Variables</i>				
Age	-0.02	0.02	-0.95	0.342
Gender ^a	-0.05	0.08	-0.61	0.546
SP Age	-0.01	0.01	-0.70	0.489
SP Gender ^a	-0.42	0.19	-2.21	0.035*

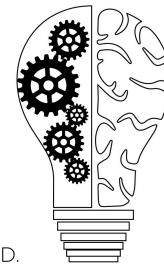
^a0 = female, 1 = male; * $p \leq .05$; ** $p \leq .01$

SE standard error; t t-value ER emotion recognition

“Table 3. Parameter estimates for crossed random effects model of student empathic behavior (judged by simulated patients) depending on students' emotion recognition and extraversion” from [Schreckenbach et al., \(2018\)](#).

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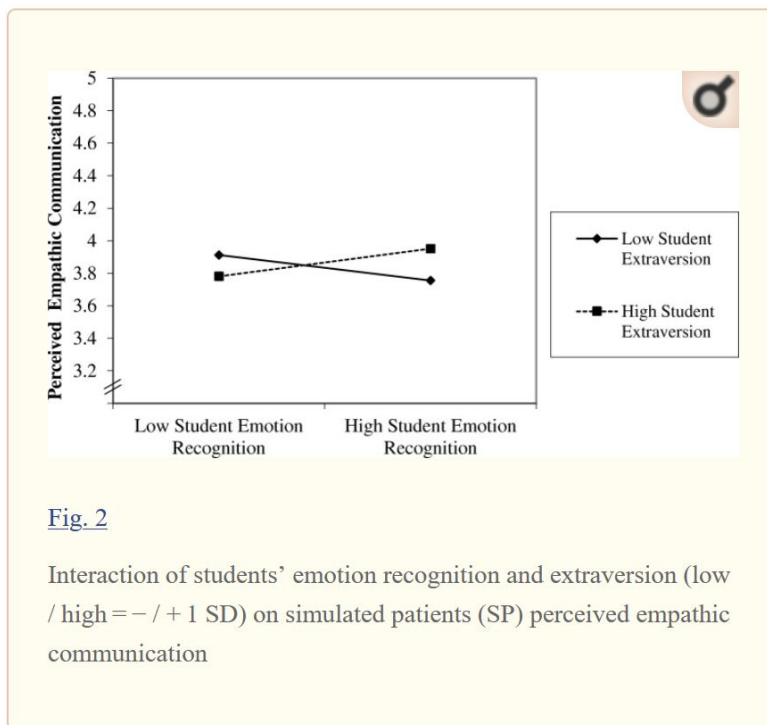


Fig. 2

Interaction of students' emotion recognition and extraversion (low / high = - / + 1 SD) on simulated patients (SP) perceived empathic communication

“Figure 2. Interaction of students' emotion recognition and extraversion (low / high = - / + 1 SD) on simulated patients (SP) perceived empathic communication” from ([Schreckenbach et al., 2018](#)).

Schreckenbach and her team considered one possible factor is that standardized patients are looking for clear, authoritative responses ([Schreckenbach et al., 2018](#)). They conclude with the point that medical training programs should consider specific professional assessment and training for personality interactions as they pertain to patient care. This may be an area for therapists, who see professional trainees and offer avenues of discovery and intervention, to provide them with tools to either accentuate their high extraversion or mediate the interpersonal downsides of low extraversion.

Sleep Deprivation

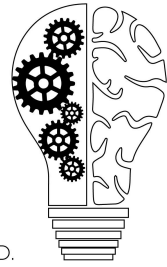
Some mental health professionals and many of their patients may be subjected to sleep deprivation. We briefly want to mention a study by [Killgore et al. \(2007\)](#) that linked people with extraversion to sleep deprivation vulnerabilities. They were interested in the research demonstrating that extraversion is linked to basal activity in the reticular-thalamic-cortical loop, which in prior research has been related to arousal. Introverts tend to have higher tonic cortical arousal than extroverts, with the subsequent hypothesis that introverts may be more resilient to sleep loss than extroverts ([Killgore et al., 2007](#)). Thus, they studied a group of 23 adult military personnel, assessed their Revised NEO Personality Inventory, and then subjected them to 77

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hours of continuous sleep deprivation and assessed them for vigilance. Half of the group received caffeine in a double-blind method to see how vigilance was mediated by chemical stimulation, and the researchers assessed vigilance with a portable reaction time test.

What they found was interesting. As one would suspect, speed performance on the portable reaction time test dropped throughout all sessions, and caffeine improved response times compared to those without caffeine. However, extraverts declined significantly more in speed performance overnight (partial correlation coefficient correcting for caffeine = -0.56 , $P < 0.005$). Subsequently, introverts and extroverts did not significantly differ on their reaction times on the second and third nights.

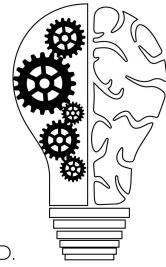


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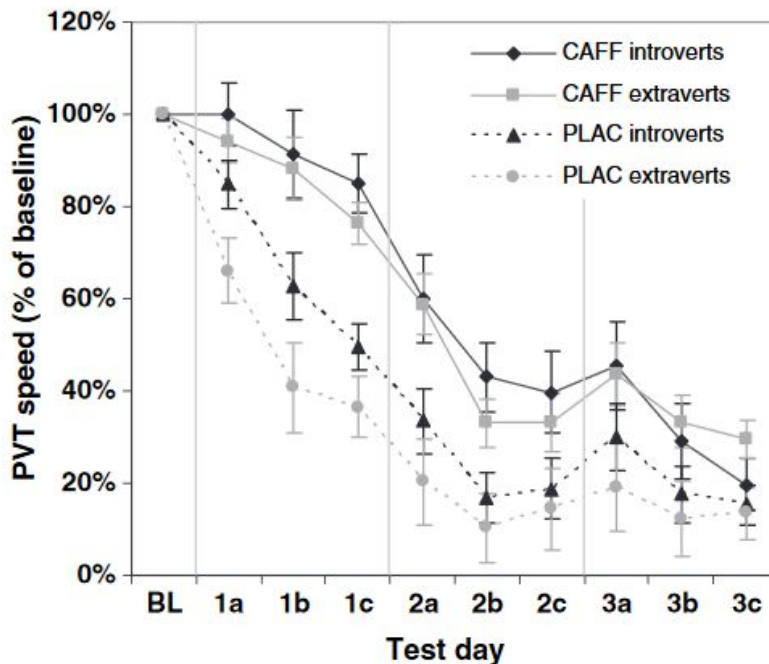
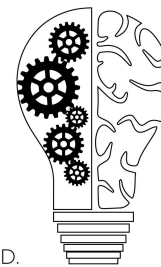


Figure 2. Psychomotor speed declines with continuous wakefulness, but the magnitude of this decline differed according to caffeine administration and the trait of Introversion–Extraversion. Speed performance (i.e. $\text{Speed} = 1/\text{Reaction Time} \times 100$) is presented as a percent of baseline (BL) performance from the first day (i.e. administered at 13:50, 15:55 and 17:50 hours). Performances are presented for each of the three overnight sessions from 00:15 to 08:50 hours each morning. Each overnight session is divided into thirds ranging from: (a) 00:15 to 03:10 hours, (b) 03:15 to 05:55 hours and (c) 06:15 to 08:50 hours. Mean (\pm SE) as a percent of baseline is presented for each of these sessions. Participants receiving caffeine (solid lines) significantly outperformed those receiving placebo (dashed lines) for all three overnight testing sessions. Moreover, participants classified as Introverts significantly outperformed participants classified as Extraverts on the first overnight session, even after the effects of caffeine were statistically controlled. Introversion–Extraversion group had no effect on subsequent nights.

“Figure 2. Psychomotor speed declines with continuous wakefulness, but the magnitude of this decline differed according to caffeine administration and the trait of Introversion–Extraversion” from ([Killgore et al., 2007](#))

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Table 2 Partial correlation coefficients between the five domain scales of the NEO-PI-R and percent change in Palm-PVT Speed for three night time testing blocks

<i>NEO-PI-R domain</i>	<i>Night 1</i>	<i>Night 2</i>	<i>Night 3</i>	<i>All nights</i>
Neuroticism (N)	0.34	0.18	0.07	0.24
Extraversion (E)	-0.56**	-0.34	-0.25	-0.47*
Openness to Experience (O)	0.06	0.17	0.28	0.20
Agreeableness (A)	-0.09	-0.07	0.00	-0.06
Conscientiousness (C)	-0.06	-0.23	-0.22	-0.21

Partial correlations controlling for drug condition. One-tailed tests, * $P < 0.05$, ** $P < 0.005$.

“Table 2. Partial correlation coefficients between the five domain scales of the NEO-PI-R and percent change in Palm-PVT Speed for three night time testing blocks” from ([Killgore et al., 2007](#))

While they note there may be other ways of explaining these findings, social learning, for example, this research provides an interesting insight into the vulnerability of different personality profiles to different physical challenges.

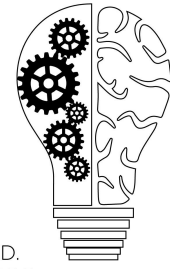
Are there disadvantages?

Social media use

Before we transition to personality disorders, it is worthwhile to note non-pathological disadvantages to the extraversion spectrum. Specifically, [Marengo et al. \(2020\)](#) looked at neuroticism and extraversion, and their interactions with social media addiction. In their study, they used passive Facebook user data and mapped it to a scale of social media addiction and a short personality scale. They used a “snowball” sampling method that began with 10 students and eventually concluded with over 1000 individuals, the majority of whom were women and 81% aged 18-25.

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In their method, they selected status updates as an indicator of “need for self-expression, and the positive social feedback received by other users, assessed via received Likes, as mediators of the link between personality and social media addiction status updates and received likes were the chosen mediators of the link between personality traits” and social media addiction ([Marengo et al., 2020, p. 106150](#)). They found that neuroticism, not extraversion, was directly associated with social media addiction, which interestingly showed a correlation with the number of “Likes” on their posts. The authors concluded that both neuroticism and extraversion appear to be linked to increased social media use. Limitations abound in this study, but it may be important for therapists to note a possible increased risk of social media addiction in patients (or themselves!) if scoring high on extraversion and neuroticism.

Is there a link to mental illness?

Extraversion & psychopathology

[Watson et al. \(2019\)](#) did a meta-analysis looking at extraversion and the correlation with different psychopathologies. They found that extraversion was significantly positively correlated with histrionic personality disorder ($r = 0.33$) and narcissism. In an older study, the correlation was not significant at 0.09, but in three newer studies, extraversion and narcissism had correlations ranging from 0.31 to 0.40. They also found negative correlations between extraversion and avoidant personality disorder ($r = -0.49$) and schizoid personality disorder ($r = -0.46$) (Table 1)([Watson et al., 2019](#)). This meta-analysis also looked at each facet of extraversion and the correlations of those with the different psychopathologies (Table 4). Histrionic personality disorder had the highest correlation with the gregariousness facet of extraversion ($r = 0.35$). Avoidant personality disorder and schizoid personality disorder had the largest negative correlations with the warmth, gregariousness, and positivity facets ranging from -0.35 to -0.48. Avoidant personality disorder had an additional negative correlation with the assertiveness facet ($r = -0.39$)(Table 4)([Watson et al., 2019](#)).

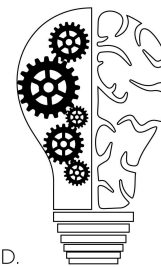
Remember, correlation doesn't equal causation. You can still be low extraversion and narcissistic or you can be high extraversion and not narcissistic.

Interestingly, antisocial personality disorder is not linked one way or the other. Things linked to low extraversion: social phobias, dysthymia disorder, depression, panic disorder, and

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obsessive-compulsive disorder. It's interesting that narcissism is correlated with extraversion, but not Machiavellianism or psychopathy, because all three usually group together.



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Table 1
Meta-analytic correlations between extraversion domain scores & psychopathology.

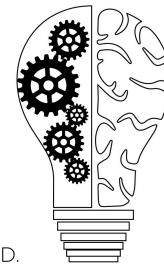
Diagnosis	Correlation
<i>Samuel and Widiger (2008)</i>	
Avoidant personality disorder	-0.49
Schizoid personality disorder	-0.46
Schizotypal personality disorder	-0.28
Paranoid personality disorder	-0.21
Dependent personality disorder	-0.15
Borderline personality disorder	-0.12
Obsessive-compulsive personality disorder	-0.12
Antisocial personality disorder	0.04
Narcissistic personality disorder	0.09
Histrionic personality disorder	0.33
<i>Ruiz et al. (2008)</i>	
Substance pathology	-0.06
Antisocial pathology	0.06
<i>Decuyper et al. (2009)</i>	
Psychopathy	0.09
Antisocial personality disorder	0.05
<i>Kotov et al., (2010)</i>	
Social phobia	-0.37
Dysthymic disorder	-0.29
Unipolar depression	-0.28
Panic disorder	-0.28
Obsessive-compulsive disorder	-0.27
Major depressive disorder	-0.25
Posttraumatic stress disorder	-0.25
Agoraphobia	-0.23
Mixed substance use	-0.19
Generalized anxiety disorder	-0.18
Overall substance use	-0.16
Drug use	-0.15
Alcohol use	-0.12
Specific phobia	-0.07
<i>O'Boyle et al. (2015)</i>	
Machiavellianism	-0.01
Psychopathy	0.04
Narcissism	0.40
<i>Muris et al. (2017)</i>	
Machiavellianism	-0.08
Psychopathy	0.01
Narcissism	0.31
<i>Vize et al. (2018a)</i>	
Machiavellianism	-0.04
Psychopathy	0.02
Narcissism	0.32

Note. Correlations with an absolute value ≥ 0.30 are in bold.

“Table 1. Meta-analytic correlations between extraversion domain scores & psychopathology” from ([Watson et al., 2019](#)).

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Table 4
 Meta-Analytic Correlations between the NEO Extraversion Facets & Psychopathology.

Disorder	Warmth	Gregar	Positive	Activity	Assert	Excite
<i>Ruiz et al. (2008)</i>						
Substance pathology	-0.23 [*]	-0.08	-0.17	-0.05	-0.14	0.17
Antisocial pathology	-0.11	-0.02	-0.04	0.07	0.08	0.30^{*,†}
<i>Samuel and Widiger (2008)</i>						
Schizotypal PD	-0.28 [*]	-0.25	-0.26	-0.13	-0.13	-0.04
Paranoid PD	-0.28 [*]	-0.20	-0.27	-0.08	-0.08	-0.01
Schizoid PD	-0.42[*]	-0.48^{*,†}	-0.38[*]	-0.25	-0.22	-0.21
Avoidant PD	-0.35[*]	-0.42[*]	-0.39[*]	-0.29 [*]	-0.39[*]	-0.23
Obsessive-compulsive PD	-0.07	-0.16 [*]	-0.09	0.03	-0.01	-0.12
Histrionic PD	0.26	0.35[*]	0.23	0.25	0.27	0.25
Borderline PD	-0.20	-0.12	-0.26 [*]	-0.10	-0.09	-0.06
Dependent PD	-0.03	-0.03	-0.15	-0.12	-0.21 [*]	-0.06
Narcissistic PD	-0.07	0.04	-0.02	0.09	0.19 [*]	0.09
Antisocial PD	-0.13	0.02	-0.09	0.02	0.06	0.25 [*]
<i>Decuyper et al. (2009)</i>						
Psychopathy	-0.20	0.03	-0.10	0.07	0.16	0.31^{*,†}
Antisocial PD	-0.13	0.00	-0.08	0.04	0.06	0.25 [*]
<i>O'Boyle et al. (2015)</i>						
Psychopathy	-0.18	0.00	-0.13	0.04	0.07	0.20 [*]
Narcissism	-0.02	0.13	-0.05	0.14	0.24 [*]	0.16
<i>Vize et al. (2018b)</i>						
Average aggression	-0.16 [*]	-0.01	-0.11	-0.01	0.08	0.13
Reactive aggression	-0.17 [*]	-0.03	-0.15	-0.06	0.01	0.12
Average AS behavior	-0.18 [*]	-0.02	-0.11	-0.01	0.05	0.17 [*]
Physical aggression	-0.16	-0.07	-0.10	0.00	0.11	0.18 [*]
Relational aggression	-0.14	0.05	-0.15	-0.08	0.01	0.19 [*]
Proactive aggression	-0.15	0.06	-0.13	0.00	0.04	0.17 [*]
Non-violent AS behavior	-0.14	-0.04	-0.05	-0.02	0.02	0.30^{*,†}

Note. Correlations with an absolute value ≥ 0.30 are in bold. Gregar = Gregariousness. Positive = Positive Emotions. Assert = Assertiveness. Excite = Excitement-Seeking. AS = Antisocial. PD = Personality disorder.

^{*} Highest correlation (absolute value within ± 0.01) in row.

[†] Highest correlation (absolute value within ± 0.01) in column.

“Table 4. Meta-Analytic Correlations between the NEO Extraversion Facets and Psychopathology” from ([Watson et al., 2019](#)).

Narcissistic personality disorder

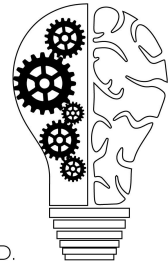
A 2019 study of 437 participants found grandiose narcissism correlated with extraversion ($r = 0.61$), assertiveness ($r = 0.71$), and enthusiasm ($r = 0.26$), while vulnerable narcissism was negatively correlated with extraversion ($r = -0.23$), assertiveness ($r = -0.14$), and enthusiasm ($r = -0.24$) ([Zajenkowski & Szymaniak, 2019](#)).

I call the vulnerable narcissist the ‘chihuahua narcissist’ because it’s the low self-esteem narcissism, and they tend to be lower extraversion and lack confidence with their low assertiveness and dominance. In contrast, the high self-esteem narcissists are the people who

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are more of a fighter, higher in confidence and extraversion. My approach with these people is to sometimes convince them that helping the greatest amount of people will give them the accomplishment of their goals. I'm trying to help them shift from only meeting their own needs to seeing that the more people you help will give you the most satisfaction, which takes time. In this type of therapy, you're challenging them a little bit. If you're too passive, they just feel like they can walk over you.



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Attention-Deficit/Hyperactivity Disorder

Lo et. al ([2017](#)) looked at genome-wide analysis of personality traits with six genomic loci. They found that high extraversion and ADHD had a correlation of 0.30 ([Lo et al., 2017](#)).

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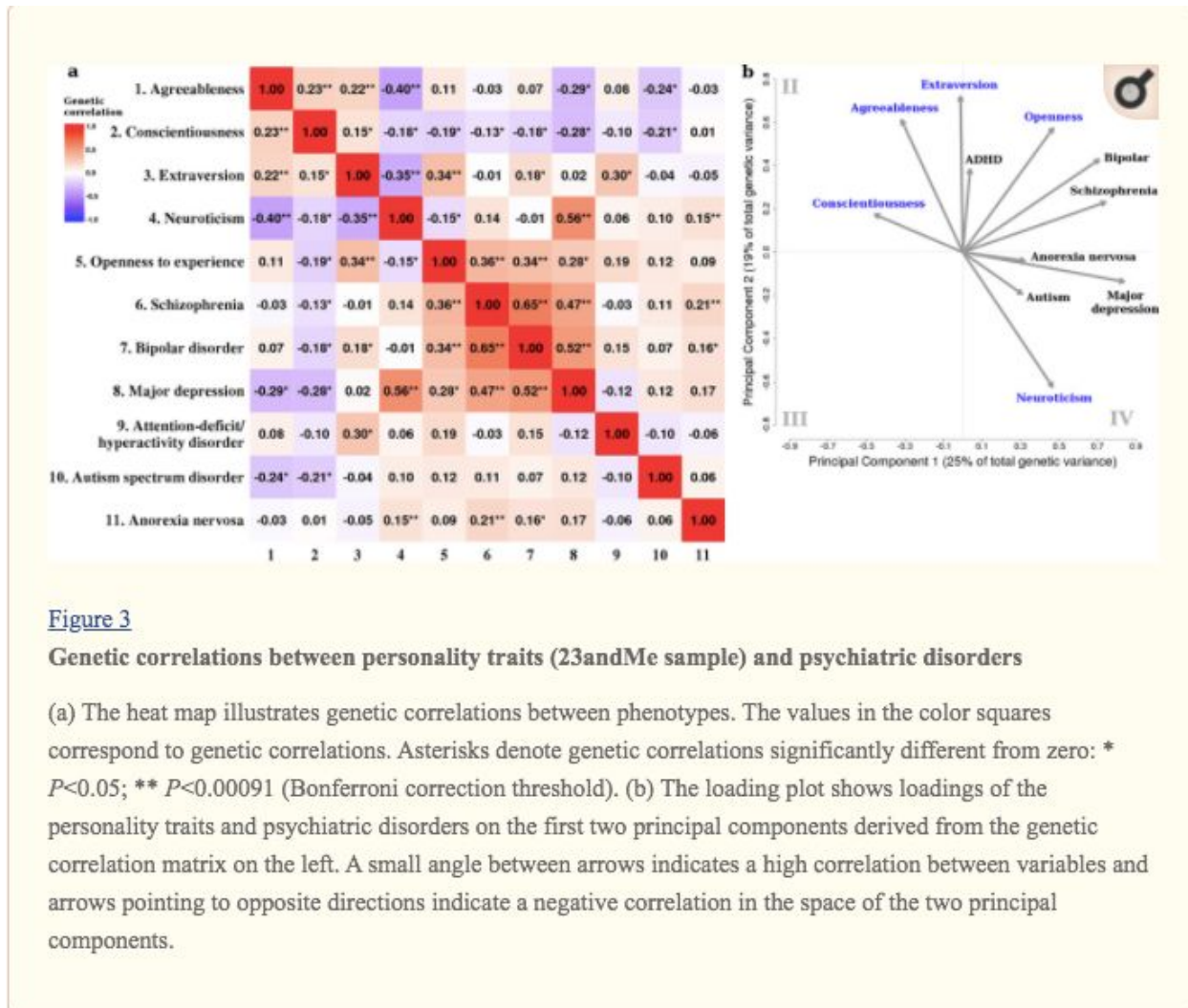


Figure 3

Genetic correlations between personality traits (23andMe sample) and psychiatric disorders

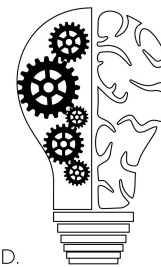
(a) The heat map illustrates genetic correlations between phenotypes. The values in the color squares correspond to genetic correlations. Asterisks denote genetic correlations significantly different from zero: * $P < 0.05$; ** $P < 0.00091$ (Bonferroni correction threshold). (b) The loading plot shows loadings of the personality traits and psychiatric disorders on the first two principal components derived from the genetic correlation matrix on the left. A small angle between arrows indicates a high correlation between variables and arrows pointing to opposite directions indicate a negative correlation in the space of the two principal components.

“Figure 3. Genetic correlations between personality traits (23andMe sample) and psychiatric disorders” from (Lo et al., 2017).

Therapy for maladaptive extraversion

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[Bucher et al. \(2019\)](#) conducted a meta-analysis of 99 studies (N = 107,206) to find the association between different personality traits and mental health treatment outcomes.

Outcomes:

- Generally, higher extraversion was associated with favorable outcomes overall.
- Significant statistical heterogeneity suggests extraversion is positively associated with outcomes such as aggregated improvement (improvement, symptom decrease, lack of symptom severity, risky behaviors, BMI/weight gain, and success/failure) and overall positive outcomes.
- Along with agreeableness, extraversion had the greatest positive impact on overall outcomes with an effect size of 0.08.
- Notably, extraversion was not strongly associated with better interpersonal outcomes (the working alliance had an effect size of 0.04). Individuals are found to be more willing to participate and communicate openly and honestly in treatment. However, these attributes did not translate to building a therapeutic relationship.
- Coping skills (various mindfulness skills, positive reframing, using humor) had the highest association with extraversion ($r = 0.11$).
- Extraversion had the strongest association with symptom reduction ($r = 0.15$).

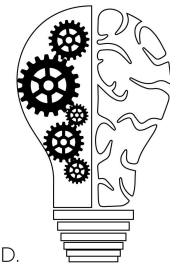
Outcome	Extraversion			
	<i>k</i>	<i>N</i>	<i>r</i>	95% CI
Abstinence	6	770	-0.002	-0.09 to 0.08
Attendance	10	2158	0.02	-0.02 to 0.06
Working Alliance	5	572	0.04	-0.07 to 0.16
Process	6	615	0.06	-0.05 to 0.17
Coping	3	226	0.11	-0.16 to 0.38
Betterment	4	480	0.04	-0.17 to 0.24
(Lack of) Sx severity	17	3060	0.13	0.07 to 0.19
Sx decrease	6	420	0.15	0.06 to 0.25
Improvement	6	1000	0.15	0.05 to 0.24
Aggregated Improvement	27	4317	0.13	0.09 to 0.18
Overall	44	6814	0.08	0.04 to 0.12

Note. r = weighted effect size; CI = confidence interval. All outcomes are keyed in the positive direction. Bolded effect sizes indicate significant heterogeneity as determined by the Q-statistic. For all domains, a positive effect size indicates that higher levels of these traits are associated with a more favorable outcome and a negative effect size indicates that lower levels of these traits are associated with more favorable outcomes. Bolded outcomes indicate those that were combined with multiple individual outcomes. Specifically, Attendance consisted of the outcomes attendance and completion. The outcome Process consisted of satisfaction with therapy, engagement in services, and client-reported working alliance. The outcome Betterment consisted of coping, self-efficacy and confidence, and interpersonal improvement. Aggregated Improvement consisted of the outcomes: improvement, symptom decrease, (lack of) symptom severity, risky behaviors, BMI/weight gain, and success/failure. The Overall outcome incorporated all therapeutic outcomes found in all studies included in the analyses.

“Table 2. Meta-analytic results for relations between personality traits and therapeutic outcomes” from (Bucher et al., 2019).

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Patient types:

- In the inpatient setting, favorable outcomes were associated with lower levels of extraversion ($r = -0.08$).
- In contrast, in the outpatient setting, higher levels of extraversion were associated with more favorable outcomes ($r = 0.11$).

Treatment length:

- Four weeks or less ($r = -0.08$): higher extraversion had a negative association with outcomes.
- Six to 11 months ($r = 0.16$): extraversion associated with more positive outcomes.

[Gore et al. \(2011\)](#) detail the following regarding maladaptively high extraversion:

- Gregariousness can become attention-seeking and inappropriate flirtatiousness (ie. histrionic).
- Assertiveness can become pushy, authoritarian (ie. narcissistic), and interpersonally dominant (ie. antisocial).
- Excitement-seeking can become reckless and risky (exhibitionism)

[Presnall \(2013\)](#) takes us through some things to consider during therapeutic interaction with maladaptively high extraverts:

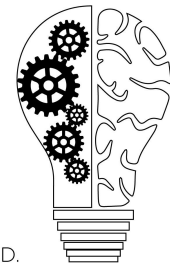
- Patients may present with long-term exhaustion of their interpersonal relationships. This includes suspected infidelity due to the consistent pursuit of outside social endeavors, causing friction in their romantic relationships.
- Consider the frequent comorbidity of substance use disorder secondary to their excitement seeking and risky behavior. Their propensity for social interaction could reinforce their substance use.
- In our differential for maladaptively high extraversion, we must distinguish these patients from bipolar disorder. You should be able to appreciate from the history that a patient's frantic energy, thrill-seeking, and interpersonal dominance are not interrupted by periods of withdrawal and low energy. Furthermore, their symptoms will be confined to interpersonal relationships.

You could be extraordinarily extraverted and have meaningful long term relationships with people because you intrinsically seek their value. Someone is a narcissist if they only think about themselves and how each interaction affects them or moves them forward, which will burn relationships. Someone who is histrionic tells excitement-oriented stories which they use to captivate people. They are often great storytellers.

The NEO personality test doesn't diagnose personality disorders, but what they will tell you is that your chances of having certain disorders may be higher or lower. It is always important to allow clinicians to give an official diagnosis.

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[Presnall \(2013\)](#) suggests that during therapy, clinicians provide frank interpersonal feedback about the thoughts, emotions, and reactions that are elicited by the client's maladaptively extraverted behavior. Since these patients are often ego-syntonic, this gives the patient a chance to gain some insight into the cause of their interpersonal issues. This is why Presnall recommends starting with individual interpersonal therapy and subsequently moving into group interpersonal therapy once the patient has gained enough insight.

Presnall explains that group therapy draws the maladaptive behaviors out, giving the patient a chance to practice actively confronting these behaviors. CBT can be a key tool during this process, and mindfulness skills would be another useful addition as it can help the patient acknowledge maladaptive cognitions in the moment (Dimidjian & Linehan, 2008). Furthermore, behavioral goals of increasing alone time and/or refraining from speaking for a proportion of a given interpersonal interaction can be helpful as well (Hayes, Strosahl, & Wilson, 1999).

[Widiger and Presnall \(2013\)](#) detail the following regarding maladaptively low extraversion:

- Familiar to clinicians
- Shy, introverted loners
- Anhedonia towards the majority of activities and relationships (i.e, schizoid)

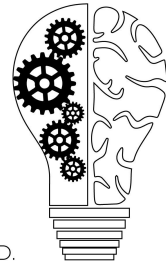
Those with less severe cases of maladaptive low extraversion could benefit from assertiveness training to counteract their inherent passivity. Patients low in extraversion should also be encouraged to make concerted effort to engage in relationships they value so they may better avoid social withdrawal and disengagement ([Lynam et al., 2012](#)).

[Presnall \(2013\)](#) takes us through some considerations for therapeutic interaction with these maladaptively low extraverts:

- They have an increased lifetime risk for social phobia, major depressive disorder, and schizophrenia. In addition, their prognoses are poor due to their lack of social support.
- Patients should begin with individual interpersonal therapy to set the context and prepare for group interpersonal therapy. The provider should make a concerted effort to establish trust and alliance with the patient so they may discuss the group therapy. Note: do not assume maladaptively low extraverts will volunteer important information. Ask specific questions and decrease open-ended questions.
- Behavioral therapy and skills training are effective therapy modalities in this population. This therapy should be informed by the provider's understanding of the specific deficits in extraversion that are hindering the patient's function, as well as the factors reinforcing them. In order to obtain that information, have the patient undergo a Five-Factor Model assessment followed by functional behavioral analysis.

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- Interpersonal and behavioral therapies may be supported by pharmacological treatment. [Tang et al. \(2009\)](#) performed a placebo-controlled randomized controlled trial in which adult patients with moderate to severe major depressive disorder received paroxetine (n=120), placebo (n= 60), or cognitive therapy (n=60). They found that paroxetine increased extraversion significantly more than placebo (effect size = 0.63). This can be crucial in helping these patients establish new healthy behaviors.

Summary

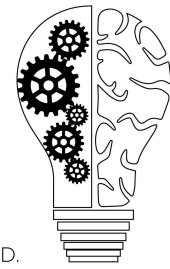
- The six facets of extraversion include: warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotion.
- Although extraversion slightly decreases over the lifespan, the facet of assertiveness increases slowly from adolescence into the 40s.
- People higher in extraversion, specifically in gregariousness and excitement seeking, had increased grey matter volume in the left caudate nucleus body, a part of the brain participating in the dopaminergic reward system.
- Those lower in extraversion had higher cortical activity found in the primary somatosensory cortex in response to the non-painful tactile stimulation, particularly in the right hemisphere.
- Extraversion is not associated with social media use perhaps because prior studies have shown that [only 5% of social media time is spent being social](#).
- High extraversion correlates to histrionic and narcissistic personality disorders.
- Low extraversion correlates to schizoid and avoidant personality disorders.
- People with maladaptively low extraversion improved with Paroxetine in one study.
- We highlighted psychotherapy treatments for both high and low extraversion.

References

- Bauer, A. C. (2005). Cognitive Behavior Therapy: Applying Empirically Supported Techniques in Your Practice. *Psychiatric Services*, 56(9), 1166–1166. <https://doi.org/10.1176/appi.ps.56.9.1166>
- Bucher, M. A., Suzuki, T., & Samuel, D. B. (2019). A meta-analytic review of personality traits and their associations with mental health treatment outcomes. *Clinical Psychology Review*, 70, 51–63. <https://doi.org/10.1016/j.cpr.2019.04.002>

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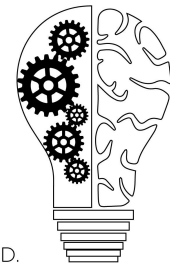
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**PSYCHIATRY &
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- Block, J. (2010). The Five-Factor Framing of Personality and Beyond: Some Ruminations. *Psychological Inquiry*, 21(1), 2–25.
<https://doi.org/10.1080/10478401003596626>
- Dimidjian, S., & Linehan, M. (2008). Mindfulness practice. In O'Donohue, W. T., & Fisher, J. E. (Eds.). (2008). *Cognitive behavior therapy: Applying empirically supported techniques in your practice* (2nd ed., pp. 327-336). John Wiley & Sons, Inc..
- Donnellan, M. B., & Lucas, R. E. (2008). Age differences in the big five across the life span: Evidence from two national samples. *Psychology and Aging*, 23(3), 558–566.
<https://doi.org/10.1037/a0012897>
- Ejova, A., Milojev, P., Worthington, E. L., Jr, Bulbulia, J., & Sibley, C. G. (2020). The Big Six Personality Traits and Mental Distress: Dynamic Modeling in a Population Panel Study Reveals Bidirectional Relationships Involving Neuroticism, Extraversion, and Conscientiousness. *Personality & social psychology bulletin*, 46(9), 1287–1302.
<https://doi.org/10.1177/0146167219895349>
- Ellershaw, J., Fullarton, C., Rodwell, J., & McWilliams, J. (2016). Conscientiousness, openness to experience and extraversion as predictors of nursing work performance: a facet-level analysis. *Journal of nursing management*, 24(2), 244–252.
<https://doi.org/10.1111/jonm.12306>
- Elovainio, M., Jokela, M., Rosenström, T., Pulkki-Råbäck, L., Hakulinen, C., Josefsson, K., Hintsanen, M., Hintsanen, T., Raitakari, O. T., & Keltikangas-Järvinen, L. (2015). Temperament and depressive symptoms: What is the direction of the association? *Journal of Affective Disorders*, 170, 203–212. <https://doi.org/10.1016/j.jad.2014.08.040>
- Gore, W. L., Tomiatti, M., & Widiger, T. A. (2011). The home for histrionism. *Personality and Mental Health*, 5(1), 57–72. <https://doi.org/10.1002/pmh.151>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. Guilford Press.
- Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin*, 130, 574–600.
<https://doi.org/10.1037/0033-2909.130.4.574>
- Jia, X., Ying, L., Zhou, X., Wu, X., & Lin, C. (2015). The effects of extraversion, social support on the posttraumatic stress disorder and posttraumatic growth of adolescent survivors of the Wenchuan earthquake. *PloS one*, 10(3), e0121480.
<https://doi.org/10.1371/journal.pone.0121480>
- Johnston, R. G., & Brown, A. E. (2013). Maternal trait personality and childbirth: the role of extraversion and neuroticism. *Midwifery*, 29(11), 1244–1250.
<https://doi.org/10.1016/j.midw.2012.08.005>
- Killgore, W. D., Richards, J. M., Killgore, D. B., Kamimori, G. H., & Balkin, T. J. (2007). The trait of Introversion-Extraversion predicts vulnerability to sleep deprivation. *Journal of sleep research*, 16(4), 354–363. <https://doi.org/10.1111/j.1365-2869.2007.00611.x>

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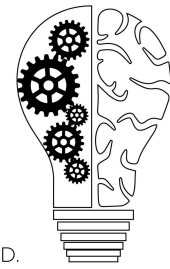
DAVID PUDER, M.D.

**PSYCHIATRY &
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- Kim, H., Schimmack, U., Oishi, S., & Tsutsui, Y. (2018). Extraversion and life satisfaction: A cross-cultural examination of student and nationally representative samples. *Journal of personality*, 86(4), 604–618. <https://doi.org/10.1111/jopy.12339>
- Klinger-König, J., Hertel, J., Terock, J., Völzke, H., Van der Auwera, S., & Grabe, H. J. (2018). Predicting physical and mental health symptoms: Additive and interactive effects of difficulty identifying feelings, neuroticism and extraversion. *Journal of psychosomatic research*, 115, 14–23. <https://doi.org/10.1016/j.jpsychores.2018.10.003>
- Kong, F., Hu, S., Xue, S., Song, Y., & Liu, J. (2015). Extraversion mediates the relationship between structural variations in the dorsolateral prefrontal cortex and social well-being. *NeuroImage*, 105, 269–275. <https://doi.org/10.1016/j.neuroimage.2014.10.062>
- Kong, X., Wei, D., Li, W., Cun, L., Xue, S., Zhang, Q., & Qiu, J. (2015). Neuroticism and extraversion mediate the association between loneliness and the dorsolateral prefrontal cortex. *Experimental brain research*, 233(1), 157–164. <https://doi.org/10.1007/s00221-014-4097-4>
- Li, M., Wei, D., Yang, W., Zhang, J., Qiu, J. (2019). Neuroanatomical correlates of extraversion: a test-retest study implicating gray matter volume in the caudate nucleus. *Neuroreport*. Oct 9;30(14):953-959. <https://doi.org/10.1097/WNR.0000000000001306>
- Lo, M. T., Hinds, D. A., Tung, J. Y., Franz, C., Fan, C. C., Wang, Y., Smeland, O. B., Schork, A., Holland, D., Kauppi, K., Sanyal, N., Escott-Price, V., Smith, D. J., O'Donovan, M., Stefansson, H., Bjornsdottir, G., Thorgeirsson, T. E., Stefansson, K., McEvoy, L. K., Dale, A. M., ... Chen, C. H. (2017). Genome-wide analyses for personality traits identify six genomic loci and show correlations with psychiatric disorders. *Nature genetics*, 49(1), 152–156. <https://doi.org/10.1038/ng.3736>
- Lucas, R. E., Diener, E., Grob, A., Suh, E. M., & Shao, L. (2000). Cross-cultural evidence for the fundamental features of extraversion. *Journal of Personality and Social Psychology*, 79(3), 452–468. <https://doi.org/10.1037/0022-3514.79.3.452>
- Luo, X., Kranzler, H. R., Zuo, L., Zhang, H., Wang, S., & Gelernter, J. (2008). ADH7 variation modulates extraversion and conscientiousness in substance-dependent subjects. *American journal of medical genetics. Part B, Neuropsychiatric genetics : the official publication of the International Society of Psychiatric Genetics*, 147B(2), 179–186. <https://doi.org/10.1002/ajmg.b.30589>
- Lynam, Donald R., Loehr, A., Miller, Joshua D., & Widiger, Thomas A. (2012). A Five-Factor Measure of Avoidant Personality: The FFAvA. *Journal of Personality Assessment*, 94(5), 466–474. <https://doi.org/10.1080/00223891.2012.677886>
- Marengo, D., Poletti, I., & Settanni, M. (2020). The interplay between neuroticism, extraversion, and social media addiction in young adult Facebook users: Testing the mediating role of online activity using objective data. *Addictive behaviors*, 102, 106150. <https://doi.org/10.1016/j.addbeh.2019.106150>

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- Monzani, L., Ripoll, P., & Peiró, J. M. (2014). Followers' agreeableness and extraversion and their loyalty towards authentic leadership. *Psicothema*, 26(1), 69–75. <https://doi.org/10.7334/psicothema2013.67>
- Piedmont, R. L. (1998). *The revised NEO Personality Inventory: Clinical and research applications*. Plenum Press. <https://doi.org/10.1007/978-1-4899-3588-5>
- Presnall, J. R. (2013). Disorders of personality: Clinical treatment from a five-factor model perspective. In T. A. Widiger & P. T. Jr. Costa (Eds.), *Personality disorders and the five-factor model of personality*, 3rd ed. (2012-10423-025; pp. 409–432). American Psychological Association. <https://doi.org/10.1037/13939-025>
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25. <https://doi.org/10.1037/0033-2909.132.1.1>
- Schaefer, M., Heinze, H. J., & Rotte, M. (2012). Touch and personality: extraversion predicts somatosensory brain response. *NeuroImage*, 62(1), 432–438. <https://doi.org/10.1016/j.neuroimage.2012.05.004>
- Schreckenbach, T., Ochsendorf, F., Sterz, J., Rüsseler, M., Bechstein, W. O., Bender, B., & Bechtoldt, M. N. (2018). Emotion recognition and extraversion of medical students interact to predict their empathic communication perceived by simulated patients. *BMC medical education*, 18(1), 237. <https://doi.org/10.1186/s12909-018-1342-8>
- Tang, T. Z., DeRubeis, R. J., Hollon, S. D., Amsterdam, J., Shelton, R., & Schalet, B. (2009). Personality change during depression treatment: A placebo-controlled trial. *Archives of General Psychiatry*, 66(12), 1322–1330. <https://doi.org/10.1001/archgenpsychiatry.2009.166>
- Tov, W., Nai, Z. L., & Lee, H. W. (2016). Extraversion and Agreeableness: Divergent Routes to Daily Satisfaction With Social Relationships. *Journal of personality*, 84(1), 121–134. <https://doi.org/10.1111/jopy.12146>
- Watson, D., Stanton, K., Khoo, S., Ellickson-Larew, S., & Stasik-O'Brien, S. M. (2019). Extraversion and psychopathology: A multilevel hierarchical review. *Journal of Research in Personality*, 81, 1–10. <https://doi.org/10.1016/j.jrp.2019.04.009>
- Weisberg, Y. J., DeYoung, C. G., & Hirsh, J. B. (2011). Gender Differences in Personality across the Ten Aspects of the Big Five. *Frontiers in Psychology*, 2, 1–23. <https://doi.org/10.3389/fpsyg.2011.00178>
- Widiger, T. A., & Presnall, J. R. (2013). Clinical Application of the Five- Factor Model. *Journal of Personality*, 81(6), 515–527. <https://doi.org/10.1111/jopy.12004>
- Zajenkowski, M., & Szymaniak, K. (2019). Narcissism between facets and domains. The relationships between two types of narcissism and aspects of the Big Five. *Current Psychology*, 1–10. <https://doi.org/10.1007/s12144-019-0147-1>