

Memo: Studying Personality and Preferences

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TBD

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Overview

Figure 1: Roberts' Model of Personality as the Output of a System.

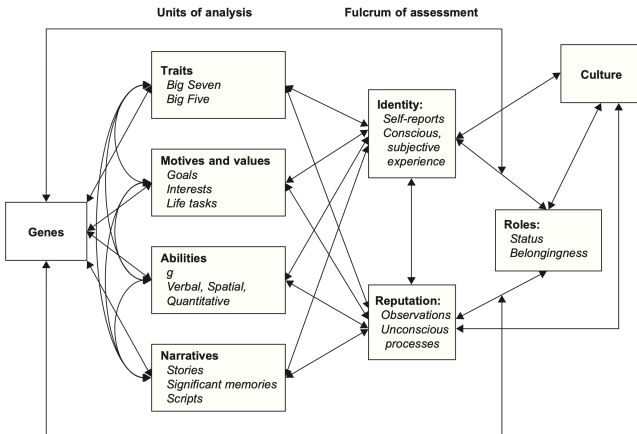
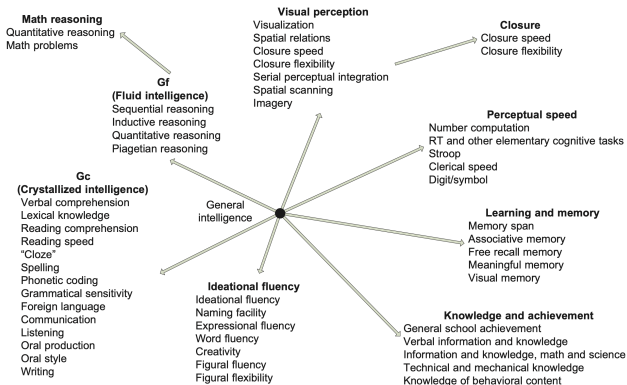


Figure 2: A Hierarchical Scheme of General Intelligence and Its Components.



The Big Five

Figure 3: The Big Five Domains and Their Facets

Big Five Personality Factor	American Psychology Association Dictionary Description	Facets (and Correlated Trait Adjective)	Related Traits	Childhood Temperament Traits
Conscientiousness	“the tendency to be organized, responsible, and hardworking”	Competence (efficient) Order (organized) Dutifulness (not careless) Achievement striving (ambitious) Self-discipline (not lazy) Deliberation (not impulsive)	Grit Perseverance Delay of gratification Impulse control Achievement striving Ambition Work ethic	Attention/(lack of) distractibility Effortful control Impulse control/delay of gratification Persistence Activity*
Openness to Experience	“the tendency to be open to new aesthetic, cultural, or intellectual experiences”	Fantasy (imaginative) Aesthetic (artistic) Feelings (excitable) Actions (wide interests) Ideas (curious) Values (unconventional)	—	Sensory sensitivity Pleasure in low-intensity activities Curiosity
Extraversion	“an orientation of one’s interests and energies toward the outer world of people and things rather than the inner world of subjective experience; characterized by positive affect and sociability”	Warmth (friendly) Gregariousness (sociable) Assertiveness (self-confident) Activity (energetic) Excitement seeking (adventurous) Positive emotions (enthusiastic)	—	Surgency Social dominance Social vitality Sensation seeking Shyness* Activity* Positive emotionality Sociability/affiliation
Agreeableness	“the tendency to act in a cooperative, unselfish manner”	Trust (forgiving) Straightforwardness (not demanding) Altruism (warm) Compliance (not stubborn) Modesty (not show-off) Tender-mindedness (sympathetic)	Empathy Perspective taking Cooperation Competitiveness	Irritability* Aggressiveness Willfulness

Continued



Figure 4: The Big Five Domains and Their Facets-Continued

Big Five Personality Factor	American Psychology Association Dictionary Description	Facets (and Correlated Trait Adjective)	Related Traits	Childhood Temperament Traits
Neuroticism/ Emotional Stability	Emotional stability is "predictability and consistency in emotional reactions, with absence of rapid mood changes." Neuroticism is "a chronic level of emotional instability and proneness to psychological distress."	Anxiety (worrying) Hostility (irritable) Depression (not contented) Self-consciousness (shy) Impulsiveness (moody) Vulnerability to stress (not self-confident)	Internal vs. External Locus of control Core self-evaluation Self-esteem Self-efficacy Optimism Axis I psychopathologies (mental disorders) including depression and anxiety disorders	Fearfulness/behavioral inhibition Shyness* Irritability* Frustration (Lack of) soothability Sadness

Note: Facets specified by the NEO-PI-R personality inventory (Costa and McCrae, 1992b). Trait adjectives in parentheses from the Adjective Check List (Gough and Heilbrun, 1983).

*These temperament traits may be related to two Big Five factors.

Source: Table adapted from John and Srivastava (1999).

Figure 5: Conceptual map for narrow dimensions from the conscientiousness domain

Definitions and indicators	Conscientiousness skills						
Skill name	Achievement motivation	Orderliness	Self-control/self-discipline	Responsibility	Discipline/rule-following	Honesty/virtue	Persistence
Definition	Setting high standards for oneself and working hard to meet them, as illustrated by a strong "work ethic," consistent effort, and high productivity.	Organizational skills are critical for planning and executing plans to reach long-term goals. (Keeps things neat and tidy.)	The ability to focus attention on the current task and avoid distractions in order to achieve personal goals. (Is efficient, gets things done.)	Time management, punctuality, and honoring commitments are critical to reliability and consistency.	Tendency to follow rules and instructions.	Tendency to be fair and honest in contact with other people.	Persistence in tasks and activities, hard to get distracted.
Typical behavioral indicators	Work habits to get by.	Like order/leave a mess.	Avoid mistakes/rush into things.	Dependable and steady/can be irresponsible.	Follow the rules/break rules.	Would never cheat on exam/usually follow the rules.	Get things done/usually give up.
Key Taxonomies and Inventories	Conscientiousness skills						
Temperament characteristics (Thomas and Chess, 1977) _[1]	Regularity		Distractibility			Task persistence	
ICD facets (Johnston et al., 2003) _[2]	Achievement orientation	Organized	Distractible				
MFIC facets (De Fruyt, Merwede and Van Leeuwen, 2002) _[3]	Achievement motivation	Orderliness	Concentration		Persistence		
BF-2 facets (Soto and John, 2017) _[4]	Productiveness	Organization		Responsibility			
Lexical sub-components (Saucier and Osherson, 1996) _[5]	Industriousness	Orderliness		Reliability			
HEXACO facets (Lee and Ashton, 2004) _[6]	Diligence	Organization, perfectionism	Prudence		Fairness		
TAPAS facets (Dragow et al., 2012) _[7]	Achievement	Order	Self-control	Responsibility	Non-delinquency	Virtue	
ABC scales (Goldberg, 1999) _[8] ; Hofstede, de Fruyt and Goldberg, 1992) _[9]	Efficiency, purposefulness, rationality	Organization, orderliness, perfectionism	Conscientiousness, cautiousness		Liberalism	Morality	
NEO PI-R scales (McCrae and Costa J., 2008) _[10]	Achievement striving	Order	Deliberation	Dutifulness	Self-discipline		
HPI homogeneous item composites (Hogan and Hogan, 1992) _[11]	Competence		Not spontaneous, impulse control	Avoids trouble		Virtuous, moralistic	
OFC scales (Sanfili et al., 1984) _[12]	Achieving, competitive	Detail conscious, forward planning	Conscientious		Traditional		
SPF scales (Corn and Robe, 1984) _[13]		Perfectionistic			Rule consciousness		

Figure 6: Conceptual map for narrow dimensions from the openness to experience domain

Definitions and indicators	Openness to experience skills					
Skill name	Intellectual efficiency	Creativity	Curiosity	Aesthetic interests	Tolerance/Cultural flexibility	Self-reflection
Definition	Intellectual competence, openness of thinking and ideas, cognitive capacities.	Generating novel ways to do or think about things through tinkering, learning from failure, insight and vision.	Interest in ideas and love of learning, understanding, and intellectual exploration.	Valuing art and beauty that may be experienced or expressed through music, writing, visual and performing arts.	Open to different points of view, value diversity, appreciative of foreign people and cultures.	Understanding one's self and/or facilitating self-improvement and self-actualisation.
Typical behavioural indicators	Fast thinkers have poor vocabulary.	Original and smart/they have difficulty imagining things.	Like to learn new things/seldom daydream.	Love art, music and literature/do not like poetry.	Have friends from different backgrounds/deslike foreigners.	Enjoy philosophical discussions/not aware of one's strengths and weaknesses.
Key Taxonomies and Inventories	Openness to experience skills					
Temperament characteristics (Thomas and Chess, 1977 _[18])				Approach-withdrawal	Adaptability	
ICID facets (Johansson et al., 2003 _[19])	Intellect		Openness to experience			
HPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002 _[20])	Intellectual efficiency	Creativity	Curiosity			
BF12 facets (Soto and John, 2017 _[21])	Creative imagination		Intellectual curiosity	Aesthetic sensitivity		
Lexical subcomponents (Saucier and Ostendorf, 1999 _[22])	Intellect		Imagination/creativity	Peculiarity		
HEXACO facets (Lee and Ashton, 2004 _[23])	Creativity		Inquisitiveness	Aesthetic appreciation	Unconventionality, flexibility	
TAPAS facets (Draigow et al., 2012 _[24])	Intellectual efficiency	Ingenuity	Curiosity	Aesthetics	Tolerance	Depth
ABSC scales (Goldberg, 1999 _[25] ; Hofstede, de Raad and Goldberg, 1992 _[26])	Intellect, competence	Ingenuity, imagination				Reflection, depth, introspection
NEO PI-R scales (McCrae and Costa Jr., 2008 _[27])	Fantasy		Ideas	Aesthetics, feeling	Actions, values	
HPI homogeneous item composites (Hogan and Hogan, 1992 _[28])	Good memory, maths ability, education	Generates ideas	Curiosity, reading, science ability	Culture		
OPQ scales (Saville et al., 1984 _[29])	Data rational, decisive	Innovative	Conceptual	Artistic	Change-oriented	Behavioural
HPF scales (Cohn and Reike, 1994 _[30])			Sensitivity	Openness to change		Abstractness



Figure 7: Conceptual map for narrowing dimensions from the extraversion domain

Definitions and indicators	Extraversion skills			
Skill name	Assertiveness	Sociability	Energy/Enthusiasm	Sensation seeking
Definition	Capacity to assert own will to accomplish goals in the face of opposition, such as speaking out, taking a stand, and confronting others if needed, courage.	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Passion and zest for life; approaching daily life with energy, excitement, and spontaneity.	Tend to seek excitement, stimulation, is expressive.
Typical behavioural indicators	Take charge/wait for others to lead the way.	Enjoys meeting new people/tends to be quiet.	Full of energy/less active than others.	Love excitement/dance parties and loud music.
Key Taxonomies and Inventories	Extraversion skills			
Temperament characteristics (Thomas and Chess, 1977 ^[22])			Intensity of reaction	Threshold of responsiveness
ICID facets (Iverson et al., 2003 ^[23])	Strong willed	Sociable-outgoing, shy	Activity level	
HPIC facets (De Foyt, Mervielde and Van Leeuwen, 2002 ^[24])		Shyness	Energy	Expressiveness
BF12 facets (Soto and John, 2017 ^[25])	Assertiveness	Sociability	Energy level	
Lexical subcomponents (Saucier and Ostendorf, 1999 ^[26])	Assertiveness	Sociability	Activity-adventurousness	Unrestraint
HEXACO facets (Lee and Ashton, 2004 ^[27])	Social boldness	Sociability	Liveliness	Expressiveness
TAPAS facets (Dreigow et al., 2012 ^[28])	Dominance	Sociability	Physical activity	Attention seeking
ABIC scales (Goldberg, 1999 ^[29] ; Hofstee, de Raad and Goldberg, 1992 ^[30])	Assertiveness, leadership	Poise, self-disclosure		Provocativeness
NEO PI-R scales (McCrae and Costa Jr., 2008 ^[31])	Assertiveness	Gregariousness	Activity	Excitement seeking
HPI homogeneity item composites (Hogan and Hogan, 1992 ^[32])	Competitive, leadership	Likes people, no social anxiety		Entertaining, exhibitionistic, likes crowds, likes parties
OPQ scales (Siville et al., 1984 ^[33])	Controlling, independent, persuasive	Affiliative, outgoing, socially confident	Active	
HPF scales (Conn and Reike, 1994 ^[34])	Dominance	Social boldness, private		Liveliness

Figure 8: Conceptual map for narrow dimensions from the agreeableness domain

Definitions and indicators	Agreeableness skills					
Skill name	Empathy	Altruism/ generosity	Co-operation/ relationship harmony	Trust	Respectfulness	Modesty
Definition	Kindness and caring for others stems from perspective-taking and empathic concern for their well-being	Generous to other people, cares about others interests, wants to help others	Living in harmony with others and valuing interconnectedness among all people	Belief that others generally have good intentions and forgiveness for those that have done wrong.	Treating people with respect and politeness according to notions of fairness, justice, and tolerance.	Is not self-centered, is moderate in needs and expectations.
Typical behavioral indicators	Sympathize with the homeless/can be cold and uncaring.	Share possessions freely/look down on others.	Easy to live with/argues a lot.	Borrows things/does not forgive people's mistakes.	Treats people with respect/sympathy to others.	Unassuming and modest/feel superior and entitled.
Key Taxonomies and Inventories	Extraversion skills					
ICID facets (Hakanson et al., 2003 ^(a))	Conscience		Antagonism, compliance			
HPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002 ^(b))	Egocentrism	Altruism	Compliance			
BFI-2 facets (Ozer and John, 2017 ^(c))	Compassion			Trust	Respectfulness	
Lexical subcomponents (Stoeberl and Ostendorf, 1998 ^(d))	Warmth-affect	Generosity	Gentleness			Modesty-humility
HEXACO facets (Lee and Ashton, 2004 ^(e))	Sincerity, sentimentality	Greed avoidance	Forgiveness, gentleness			Modesty
TAPAS facets (Dragow et al., 2013 ^(f))	Consideration	Selflessness	Co-operation			
ABSC scales (Goldberg, 1995 ^(g) ; Holtzke, de Raad and Goldberg, 1993 ^(h))	Warmth, tenderness, empathy, understanding	Sympathy	Phasanthess, nurturance			
NEO PI-R scales (McCrae and Costa Jr., 2008 ⁽ⁱ⁾)	Positive emotions, warmth	Tender-mindedness, altruism	Compliance	Trust		
HPI homogeneity items composite (Hogan and Hogan, 1992 ^(j))	Caring, sensitive, empathy		Easy to live with	Trusting		
OPS scales (Smith et al., 1984 ^(k))	Caring		Critical, democratic			Modest
IPP scales (Carr and Reike, 1984 ^(l))	Warmth					

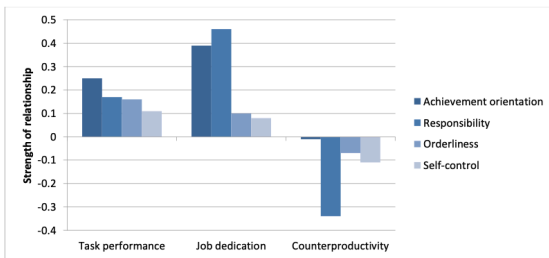
Figure 9: Conceptual map for narrow dimensions from the emotional stability domain

Definitions and indicators	Emotional stability skills		
Skill name	Stress resistance/vs. anxiety	Emotional control/volatility	Optimism
Definition	Able to deal with anxiety and stress; untroubled by excessive worry and able to calmly solve problems.	Effective strategies for regulating temper, anger, and irritation; able to maintain tranquility and composure in the face of frustrations.	Positive and optimistic expectations for self and life; anticipates success; a "can-do" mindset.
Typical behavioural indicators	Worry about things/relaxed most of the time.	Rarely gets irritated/gets angry easily.	Often feels depressed/feels optimistic about the future.
Key Taxonomies and Inventories	Emotional stability skills		
Temperament characteristics (Thomas and Chess, 1977 ^[14])			Quality of mood
ICID facets (Halverson et al., 2003 ^[14])	Fearful/insecure	Negative affect	Positive emotions
HIPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002 ^[15])	Anxiety	Irritability*	Self-confidence, optimism*
BF1-2 facets (Soto and John, 2017 ^[16])	Anxiety	Emotional volatility	Depression
Lexical subcomponents (Saucier and Cohen, 1999 ^[17])	Insecurity, emotionality	Irritability, emotionality	
HEXACO facets (Lee and Ashton, 2004 ^[18])	Fearfulness, anxiety	Patience	Dependence
TAPAS facets (Dragow et al., 2012 ^[19])	Adjustment	Even tempered	Optimism
ABSC scales (Goldberg, 1999 ^[20] ; Hoffman, de Raad and Goldberg, 1992 ^[21])	Toughness	Calmness, stability, tranquility	Happiness, moderation
NEO PI-R scales (McCrae and Costa Jr., 2008 ^[22])	Anxiety, self-consciousness, vulnerability	Hostility, impulsiveness	Depression
HPI homogeneous item composites (Hogan and Hogan, 1992 ^[23])	No somatic complaints, not anxious, not autonomous	Even tempered, calmness, no hostility	Identity, no depression, good attachment, no guilt
OPA scales (Saville et al., 1984 ^[24])	Worrying	Emotional control, tough-minded, relaxed	Optimistic
16PF scales (Cattell and Rahe, 1984 ^[25])	Apprehensive	Emotional stability	Tension

Note: * In the HIPIC taxonomy, irritability and optimism facets are part of benevolence and extraversion, respectively.



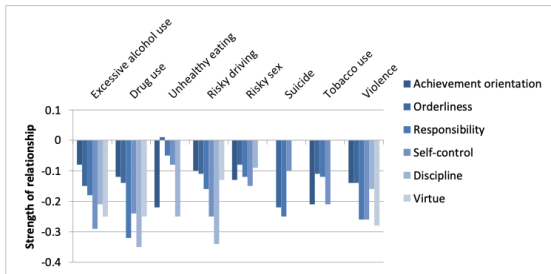
Figure 10: Relationship between conscientiousness-related skills and college and high-school grades



Note: Strength of relationships represents average correlation across studies. Correlations are corrected for scale reliability (i.e. they represent estimated true-score correlations).

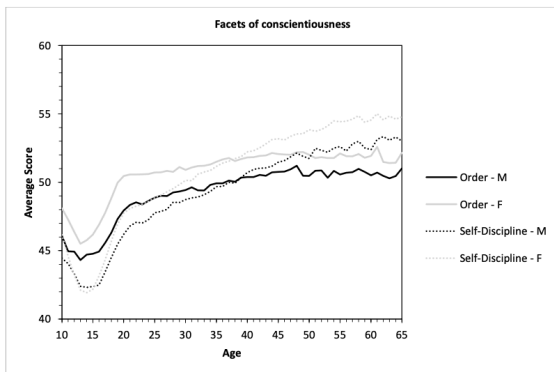
Source: Adapted from Dudley et al. (2006^[259]), "A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits", <https://doi.org/10.1037/0021-9010.91.1.40>.

Figure 11: Relationship between conscientiousness-related skills and job performance



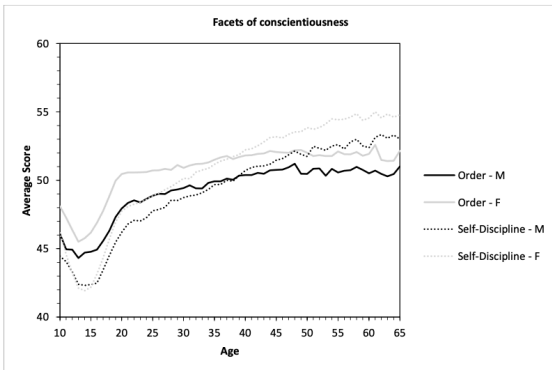
Note: Strength of relationships represents average correlation across studies.
 Source: Adapted from Bogg and Roberts (2004^[107]), "Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality", <http://dx.doi.org/10.1037/0033-2909.130.6.887>.

Figure 12: Relationship between conscientiousness-related skills and health-related behaviours performance



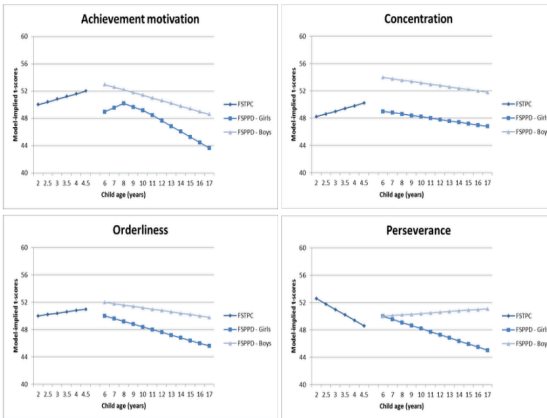
Source: Adapted from Soto et al. (2011_[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <https://doi.org/10.1037/a0021717>.

Figure 13: Average levels of self-discipline and order across a lifetime



Source: Adapted from Soto et al. (2011^[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <https://doi.org/10.1037/a0021717>.

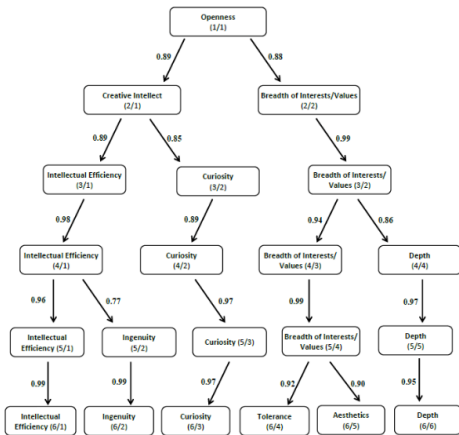
Figure 14: Estimated levels of conscientiousness facets from age 2 to 17



Note: FSTPC = Flemish Study on Temperament and Personality in Childhood; FSPPD = Flemish Study on Parenting, Personality, and Development.

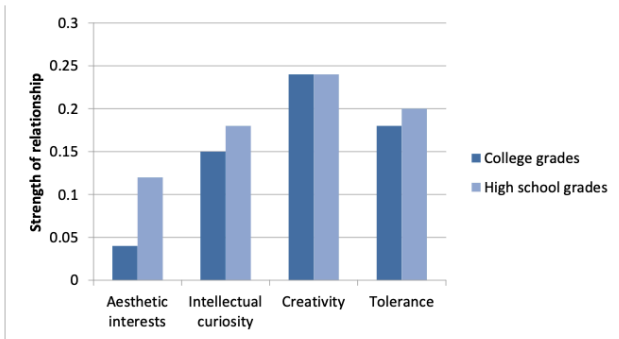
Source: Adapted from De Haan et al. (2017)^[196], "Long-term developmental changes in children's lower-order Big Five personality facets", <https://doi.org/10.1111/jopy.12265>.

Figure 15: Hierarchical structure of openness to experience



Source: Adapted from Drasgow et al. (2012)^[243], "Development of the Tailored Adaptive Personality Assessment System (TAPAS) to support Army selection and classification decisions", <http://www.dtic.mil/dtic/tr/fulltext/u2/a564422.pdf>.

Figure 16: Relationship between openness-related skills and college and high school grades



Note: Strength of relationships represents average correlation across studies.

Source: Adapted from Dudley et al. (2006^[259]), "A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits", <http://dx.doi.org/10.1037/0021-9010.91.1.40>.

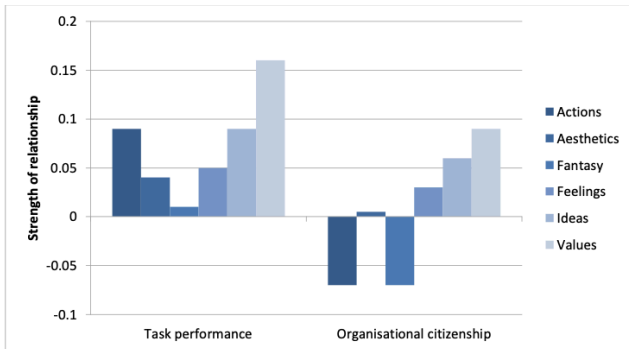
Figure 17: Meta-analytic correlations of openness and its facets with cognitive ability

Openness predictor	N	k _d	k _c	r _{xy}	SD _r	95% CI		ρ _{xy}	SD _p
						Lower	Upper		
Overall dimension	85,140	8	102	.14	.11	.08	.21	.17	.12
Intellect aspect	34,021	5	50	.22	.10	.15	.29	.25	.11
Culture aspect	26,612	5	38	.06	.08	-.02	.13	.07	.08
Intellectual efficiency	20,430	5	23	.24	.09	.18	.30	.28	.10
Ingenuity	5,440	4	16	.10	.11	.00	.21	.12	.12
Curiosity	8,151	4	11	.24	.07	.17	.31	.28	.07
Aesthetics	4,206	2	11	.03	.12	-.07	.13	.03	.12
Tolerance	19,420	4	18	.07	.07	.01	.12	.08	.07
Depth	2,986	3	9	.04	.07	-.07	.15	.05	.05

Note: N = combined sample size; k_d = number of studies; k_c = number of correlations; r_{xy} = observed mean correlation; SD_r = standard deviation of observed correlations; CI = confidence interval; ρ_{xy} = estimated mean population correlation; SD_p = standard deviation of estimated population correlations.

Source: Adapted from Woo et al. (2014^[270]), "Openness to experience: its lower level structure, measurement, and cross-cultural equivalence", <https://doi.org/10.1080/00223891.2013.806328>.

Figure 18: Relationship between openness to experience-related skills and job performance



Note: Strength of relationships represents average correlation across studies.

Source: Adapted from Judge et al. (2013)^[261], "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", <https://doi.org/10.1037/a0033901>.

Figure 19: Relationship between openness facets and adaptive performance

Openness facet	N	k_d	k_c	r_{xy}	ρ_{xy}
Intellectual efficiency	7,802	7	28	0.07	0.09
Ingenuity	2,131	3	6	0.18	0.23
Curiosity	4,531	4	14	0.1	0.13
Aesthetics	3,093	6	17	0.01	0.02
Tolerance	3,603	6	16	0.08	0.12
Depth	1,513	3	5	0.01	0.01

Note: N = combined sample size; k_d = number of studies; k_c = number of correlations; r_{xy} = observed mean correlation; ρ_{xy} = estimated mean population correlation.

Source: Adapted from Woo et al. (2014_[270]), "Openness to experience: its lower level structure, measurement, and cross-cultural equivalence", <https://doi.org/10.1080/00223891.2013.806328>.

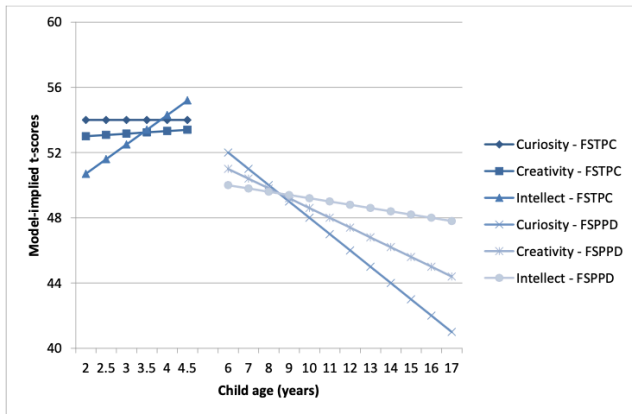
Figure 20: Average levels of ideas and aesthetics across a lifetime



Source: Adapted from Soto et al. (2011_[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <http://dx.doi.org/10.1037/a0021717>.

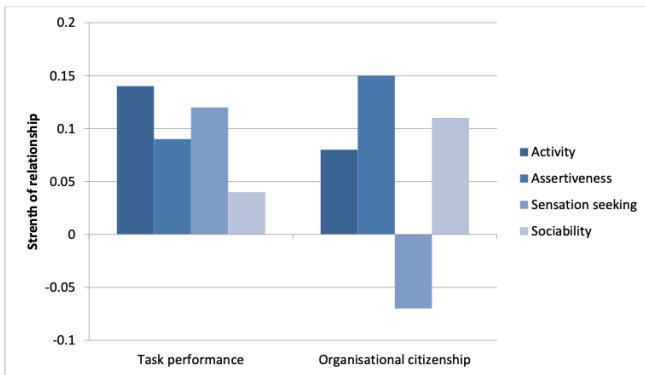
Figure 21: Estimated levels of creativity, curiosity, and intellect from age 2 to

17



Source: Adapted from De Haan et al. (2017⁽¹⁹⁶⁾), "Long-term developmental changes in children's lower-order Big Five personality facets", <https://doi.org/10.1111/jopy.12265>.

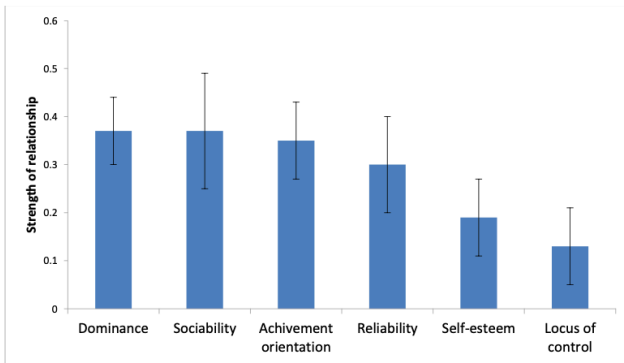
Figure 22: Relationship between extraversion-related skills and task performance and organisational citizenship



Note: Strength of relationships represents average correlation across studies.

Source: Adapted from Judge et al. (2013_[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", <http://dx.doi.org/10.1037/a0033901>.

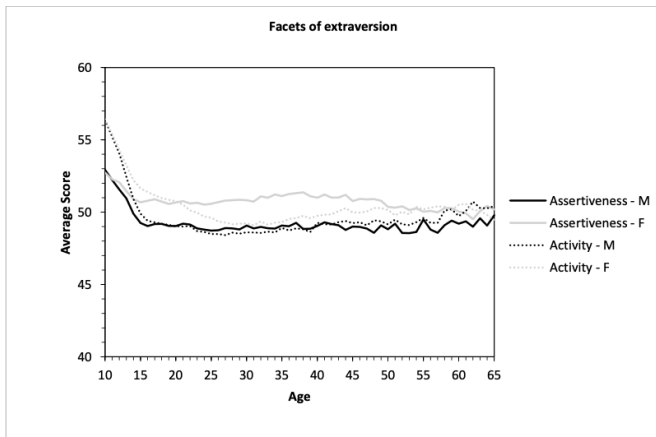
Figure 23: Meta-analysis of the relationship between personality facets and leadership



Note: Strength of relationship represents average correlation coefficients across studies. Vertical bars represent 95% confidence intervals. The correlations are corrected for scale reliability.

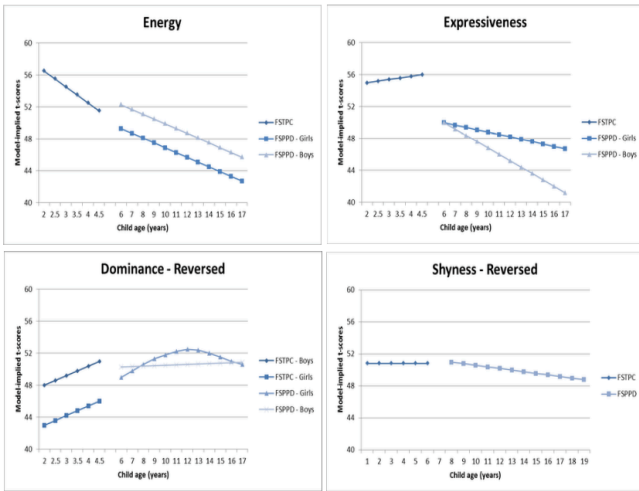
Source: Adapted from Judge et al. (2002^[279]), "Personality and leadership: A qualitative and quantitative review", <http://dx.doi.org/10.1037//0021-9010.87.4.765>.

Figure 24: Average levels of assertiveness and activity across a lifetime



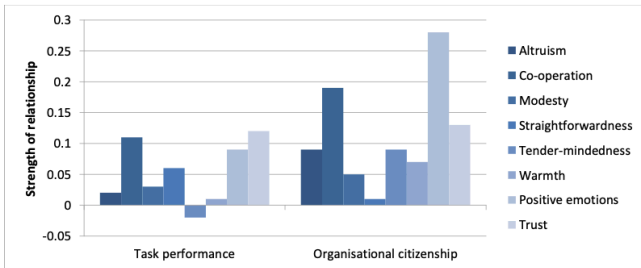
Source: Adapted from Soto et al. (2011_[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <http://dx.doi.org/10.1037/a0021717>.

Figure 25: Estimated levels of energy, expressiveness, dominance and shyness (reversed) from age 2 to 17



Source: Adapted from De Haan et al. (2017_[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", <https://doi.org/10.1111/jopy.12265>.

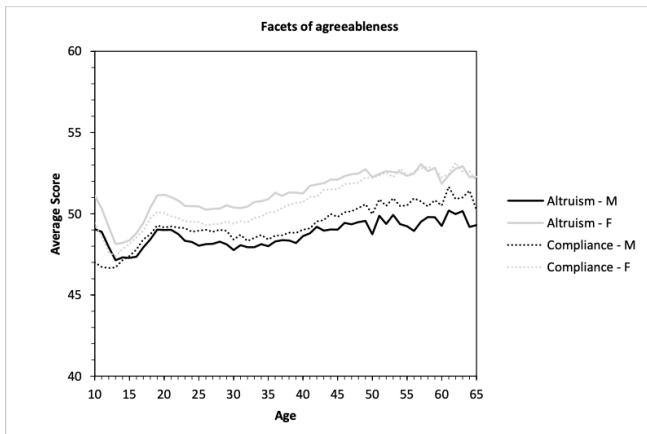
Figure 26: Relationship between agreeableness-related skills and task performance and organisational citizenship



Note: Strength of relationships represents average correlation across studies.

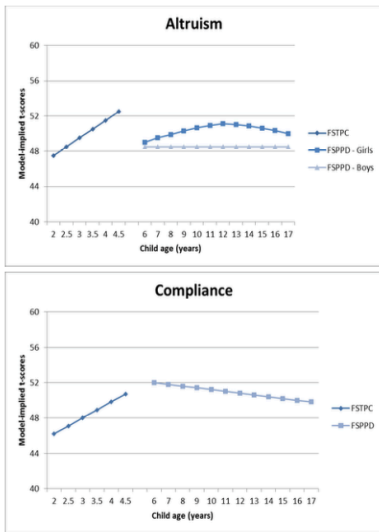
Source: Adapted from Judge et al. (2013^[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", <http://dx.doi.org/10.1037/a0033901>.

Figure 27: Average levels of altruism and compliance across a lifetime



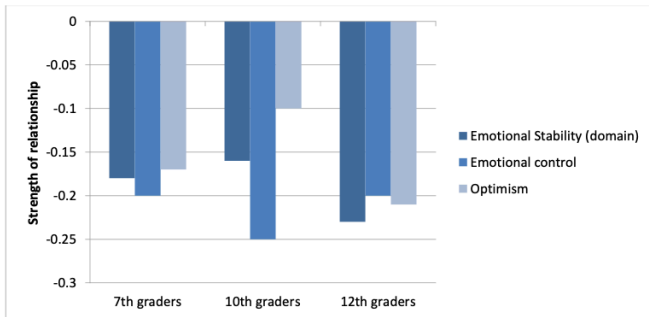
Source: Adapted from Soto et al. (2011_[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <http://dx.doi.org/10.1037/a0021717>.

Figure 28: Estimated levels of altruism and compliance from age 2 to 17



Source: Adapted from De Haan et al. (2017^[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", <https://doi.org/10.1111/jopy.12265>.

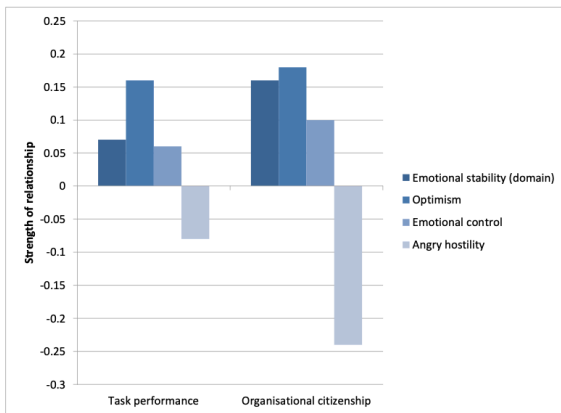
Figure 29: Personality characteristics and school absences by grade level



Note: Strength of relationships represents average correlation across studies.

Source: Adapted from Lounsbury et al. (2004_[269]), "An investigation of personality traits in relation to adolescent school absenteeism", <https://doi.org/10.1023/B:JOYO.0000037637.20329.97>.

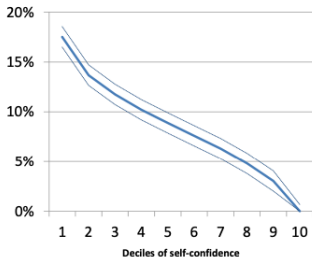
Figure 30: Relationship between emotional stability related skills and task performance and organisational citizenship



Note: Strength of relationships represents average correlation across studies.

Source: Adapted from Judge et al. (2013^[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", <http://dx.doi.org/10.1037/a0033901>.

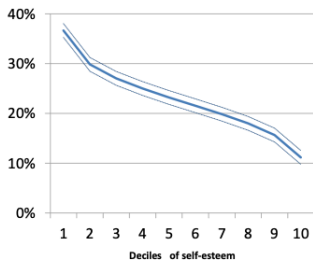
Figure 31: Probability of obesity as a function of self-confidence (in deciles) from the Youth in Norway study



Note: The solid line depicts the probability of BMI greater than 30 with 2.5-97.5% confidence intervals given by dashed lines.

Source: OECD (2015_[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, <http://dx.doi.org/10.1787/9789264226159-en>.

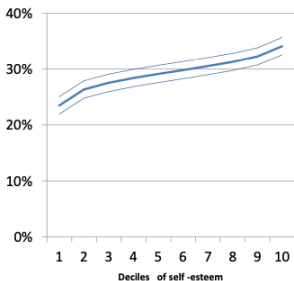
Figure 32: Probability of self-reported depression at age 25 as a function of self-esteem (in deciles) from Switzerland's Transition from Education to Employment study



Note: The solid line depicts the probability of being in the top quartile of a depression scale and the dotted lines depict the 2.5-97.5% confidence interval.

Source: OECD (2015^[1]) *Skills for Social Progress: The Power of Social and Emotional Skills*, <http://dx.doi.org/10.1787/9789264226159-en>.

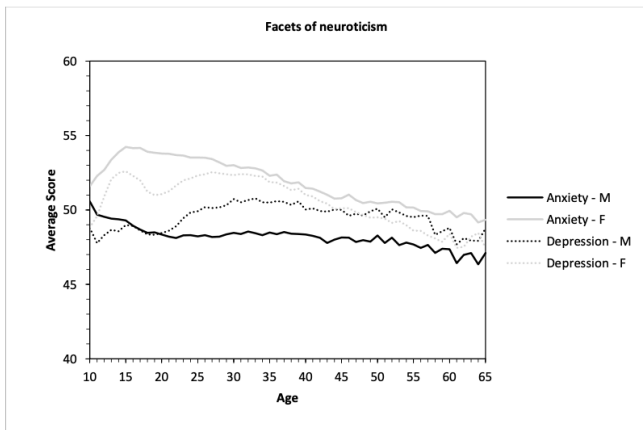
Figure 33: Probability of having a positive attitude towards life at age 25 as a function of self-esteem at age 16 (deciles) using data from Switzerland's Transition from Education to Employment study



Note: The solid line depicts the probability of having a positive attitude towards life at age 25 and the dotted lines depict the 2.5-97.5% confidence interval.

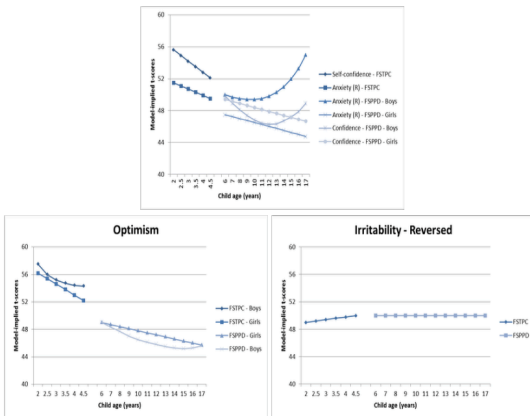
Source: OECD (2015^[1]) *Skills for Social Progress: The Power of Social and Emotional Skills*, <http://dx.doi.org/10.1787/9789264226159-en>.

Figure 34: Average levels of anxiety and depression across a lifetime



Source: Adapted from Soto et al. (2011_[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", <http://dx.doi.org/10.1037/a0021717>.

Figure 35: Estimated levels of anxiety, confidence, irritability, and optimism from age 2 to 17



Source: Adapted from De Haan et al. (2017^[106]), "Long-term developmental changes in children's lower-order Big Five personality facets", <http://dx.doi.org/10.1111/jopy.12265>.

Compound Skills based on Big Five

Figure 36: Selected social and emotional skills for inclusion in the SSES

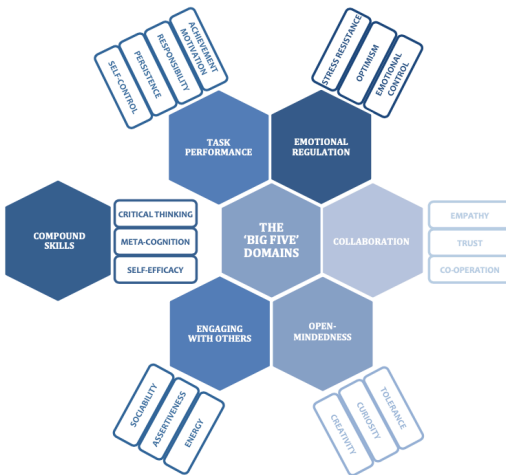


Figure 37: Definitions and behavioural indicators of compound skills

Broad domain	Skill names	Description/definition	Typical behavioural indicators
Compound skills	Self-efficacy	Beliefs in one's capabilities to mobilise the motivation, cognitive resources, and courses of action needed to meet given situational demands.	Can deal with most problems/ avoids difficult situations.
	Independence/ Critical thinking	Thinking for yourself; grounding beliefs, attitudes, and values on a critical analysis through independent thought.	Thinks critically about things/ is dependent on others for guidance.
	Meta-cognition/ Self-reflection	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and possessing the ability to reflect on and articulate such experiences (meta-cognition).	Likes complex problems/ avoids philosophical discussions.

Figure 38: Description of the skills included in the SSES

"BIG FIVE" DOMAINS	SKILLS	DESCRIPTION	BEHAVIOURAL EXAMPLES
TASK PERFORMANCE (Conscientiousness)	ACHIEVEMENT ORIENTATION	Setting high standards for oneself and working hard to meet them	Enjoys reaching a high level of mastery in some activity. Opposite: uninterested in career development.
	RESPONSIBILITY	Able to honour commitments, and be punctual and reliable.	Arrives on time for appointments, gets chores done right away. Opposite: doesn't follow through on agreements/promises.
	SELF-CONTROL	Able to avoid distractions and focus attention on the current task in order to achieve personal goals.	Doesn't rush into things, is cautious and risk averse. Opposite: is prone to impulsive shopping or binge drinking.
	PERSISTENCE	Persevering in tasks and activities until they get done.	Finishes homework projects or work once started. Opposite: Gives up easily when confronted with obstacles/distractions.
EMOTION REGULATION (Emotional stability)	STRESS RESISTANCE	Effectiveness in modulating anxiety and able to calmly solve problems (is relaxed, handles stress well).	Is relaxed most of the time, performs well in high-pressure situations. Opposite: worries about things, difficulties sleeping.
	OPTIMISM	Positive and optimistic expectations for self and life in general.	Generally in good mood. Opposite: often feels sad, tends to feel insecure.
	EMOTIONAL CONTROL	Effective strategies for regulating temper, anger and irritation in the face of frustrations.	Controls emotions in situations of conflict. Opposite: gets upset easily; is moody.
COLLABORATION (Agreeableness)	EMPATHY	Kindness and caring for others and their well-being that leads to valuing and investing in close relationships.	Consols a friend who is upset, sympathises with the homeless. Opposite: Tends to disregard other person's feelings.
	TRUST	Assuming that others generally have good intentions and forgiving those who have done wrong.	Lends things to people, avoids being harsh or judgmental. Opposite: is suspicious of people's intentions.
	CO-OPERATION	Living in harmony with others and valuing interconnectedness among all people.	Finds it easy to get along with people, respects decisions made by a group. Opposite: has a sharp tongue, is not prone to compromises.
OPEN- MINDEDNESS (Openness to experience)	CURIOSITY	Interest in ideas and love of learning, understanding and intellectual exploration; an inquisitive mindset.	Likes to read books, to travel to new destinations. Opposite: dislikes change, is not interested in exploring new products.



Figure 39: Description of the skills included in the SSES

"BIG FIVE" DOMAINS	SKILLS	DESCRIPTION	BEHAVIOURAL EXAMPLES
OPEN-MINDEDNESS (Openness to experience)	TOLERANCE	Is open to different points of view, values diversity, is appreciative of foreign people and cultures.	Have friends from different backgrounds. Opposite: dislikes foreigners.
	CREATIVITY	Generating novel ways to do or think about things through exploring, learning from failure, insight and vision.	Has original insights, is good at the arts. Opposite: seldom daydreams, dresses conventionally.
ENGAGEMENT WITH OTHERS (Extraversion)	SOCIABILITY	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Skilled at teamwork, good at public speaking. Opposite: avoids large groups, prefers one-to-one communication.
	ASSERTIVENESS	Able to confidently voice opinions, needs, and feelings, and exert social influence.	Takes charge in a class or team. Opposite: waits for others to lead the way, keeps quiet when disagrees with others.
	ENERGY	Approaching daily life with energy, excitement and spontaneity.	Is always busy; works long hours. Opposite: gets tired easily.
COMPOUND SKILLS	SELF-EFFICACY	The strength of individuals' beliefs in their ability to execute tasks and achieve goals.	Remains calm when facing unexpected events. Opposite: avoids challenging situations.
	CRITICAL THINKING/INDEPENDENCE	The ability to evaluate information and interpret it through independent and unconstrained analysis.	Good at solving problems, at ease in new and unknown situations. Opposite: dependent on others' guidance.
	SELF-REFLECTION/META-COGNITION	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and the ability to reflect on and articulate such experiences.	Good exam preparation strategies, able to master skills more effectively. Opposite: over- or under-estimates time needed for exam preparation or project completion.

Other Personality Traits

Figure 40: Competing Taxonomies of Personality.

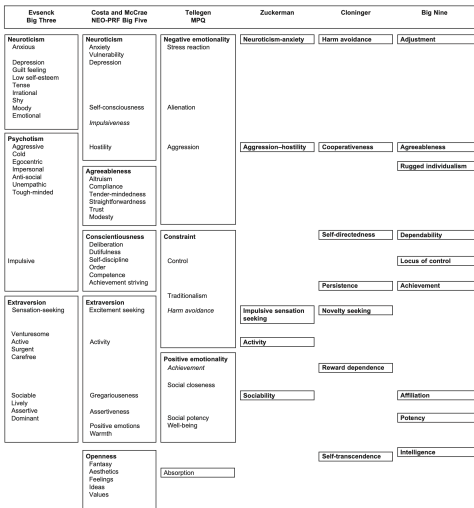


Table 1: The HEXACO Personality Inventory - Revised Domain- and Facet-Level Scales

Domain-Level Scales	Facet-Level Scales
Honesty-Humility	Sincerity Fairness Greed Avoidance Modesty
Emotionality	Fearfulness Anxiety Dependence Sentimentality
Extraversion	Social Self-Esteem Social Boldness Sociability Liveliness
Agreeableness	Forgivingness Gentleness Flexibility Patience
Conscientiousness	Organization Diligence Perfectionism Prudence
Openness to Experience	Aesthetic Appreciation Inquisitiveness Creativity Unconventionality Interstitial Scale Altruism

Figure 41: Means, Standard Deviations, and Alpha Reliabilities of the HEXACO-100 Scales

	Student sample: Self-reports					Student sample: Observer reports					Online sample: Self-reports					
	Total	Women	Men	Sex diff.	d_{sex}	Total	Women	Men	Sex diff.	d_{sex}	Total	Women	Men	Sex diff.	d_{sex}	
	(N = 2,868)	(N = 1,843)	(N = 1,001)			(N = 2,863)	(N = 1,839)	(N = 1,000)			(N = 100,318)	(N = 48,562)	(N = 50,397)			
	M (SD)	α	M (SD)	M (SD)		M (SD)	α	M (SD)	M (SD)		M (SD)	α	M (SD)	M (SD)	d_{sex}	
Factor-level scales																
Honesty–Humility	3.24 (0.60)	.82	3.34 (0.56)	3.06 (0.62)	0.49	3.22 (0.63)	.84	3.32 (0.60)	3.04 (0.64)	0.45	3.30 (0.74)	.89	3.45 (0.69)	3.15 (0.76)	0.42	
Emotionality	3.42 (0.61)	.84	3.66 (0.50)	3.00 (0.57)	1.23	3.30 (0.61)	.83	3.54 (0.51)	2.87 (0.53)	1.28	3.12 (0.63)	.84	3.38 (0.56)	2.86 (0.58)	0.92	
Extraversion	3.47 (0.58)	.85	3.46 (0.59)	3.51 (0.56)	-0.09	3.52 (0.59)	.88	3.50 (0.59)	3.55 (0.60)	-0.09	3.22 (0.64)	.86	3.21 (0.64)	3.23 (0.64)	-0.03	
Agreeableness	2.97 (0.58)	.84	2.95 (0.58)	3.03 (0.60)	-0.13	3.12 (0.66)	.89	2.78 (0.63)	3.12 (0.67)	0.01	2.78 (0.63)	.86	2.78 (0.62)	2.78 (0.64)	0.01	
Conscientiousness	3.45 (0.58)	.84	3.51 (0.56)	3.35 (0.59)	0.28	3.45 (0.63)	.89	3.55 (0.59)	3.27 (0.65)	0.46	3.52 (0.55)	.82	3.55 (0.55)	3.49 (0.56)	0.11	
Openness	3.32 (0.61)	.81	3.31 (0.62)	3.34 (0.61)	-0.04	3.14 (0.62)	.82	3.15 (0.61)	3.11 (0.63)	0.07	3.69 (0.57)	.82	3.65 (0.60)	3.73 (0.55)	-0.14	
Facet-level scales (Honesty–Humility)																
Sincerity	3.20 (0.77)	.66	3.21 (0.77)	3.18 (0.78)	0.05	3.16 (0.78)	.68	3.16 (0.78)	3.16 (0.78)	0.00	3.24 (0.91)	.78	3.31 (0.89)	3.17 (0.92)	0.16	
Fairness	3.44 (0.95)	.76	3.63 (0.85)	3.08 (1.02)	0.59	3.43 (0.96)	.82	3.61 (0.89)	3.09 (1.0)	0.56	3.53 (1.06)	.83	3.73 (0.98)	3.33 (1.11)	0.39	
Greed Avoidance	2.74 (0.93)	.81	2.81 (0.89)	2.60 (0.97)	0.22	2.74 (0.92)	.80	2.85 (0.89)	2.55 (0.94)	0.33	3.00 (1.01)	.83	3.11 (0.98)	2.88 (1.01)	0.24	
Modesty	3.59 (0.75)	.68	3.71 (0.71)	3.37 (0.78)	0.47	3.56 (0.75)	.70	3.65 (0.71)	3.38 (0.78)	0.37	3.42 (0.87)	.79	3.63 (0.79)	3.22 (0.90)	0.49	
(Emotionality)																
Fearfulness	3.11 (0.86)	.70	3.38 (0.78)	2.62 (0.81)	0.95	3.19 (0.83)	.70	3.48 (0.73)	2.67 (0.76)	1.08	2.81 (0.84)	.70	3.12 (0.80)	2.52 (0.77)	0.76	
Anxiety	3.70 (0.78)	.64	3.88 (0.68)	3.36 (0.84)	0.68	3.33 (0.77)	.66	3.51 (0.72)	2.99 (0.76)	0.71	3.54 (0.86)	.73	3.76 (0.79)	3.32 (0.87)	0.53	
Dependence	3.32 (0.91)	.80	3.55 (0.85)	2.90 (0.86)	0.75	3.28 (0.83)	.74	3.51 (0.76)	2.86 (0.80)	0.83	2.84 (0.88)	.76	3.08 (0.87)	2.61 (0.83)	0.55	
Sentimentality	3.57 (0.79)	.70	3.82 (0.69)	3.12 (0.76)	0.96	3.41 (0.78)	.73	3.65 (0.70)	2.97 (0.71)	0.97	3.28 (0.85)	.73	3.58 (0.78)	2.99 (0.81)	0.74	
(Extraversion)																
Social Self-Esteem	3.81 (0.68)	.67	3.78 (0.68)	3.85 (0.68)	-0.09	3.82 (0.63)	.69	3.81 (0.63)	3.85 (0.65)	-0.06	3.56 (0.77)	.70	3.51 (0.76)	3.61 (0.76)	-0.13	
Social Boldness	2.99 (0.88)	.76	2.91 (0.90)	3.15 (0.82)	-0.27	3.08 (0.88)	.78	3.00 (0.89)	3.22 (0.84)	-0.26	3.05 (0.87)	.72	2.99 (0.88)	3.10 (0.86)	-0.12	
Sociability	3.58 (0.78)	.71	3.60 (0.78)	3.54 (0.77)	0.07	3.57 (0.81)	.77	3.57 (0.80)	3.56 (0.83)	0.01	3.02 (0.88)	.77	3.07 (0.89)	2.97 (0.87)	0.11	
Liveliness	3.52 (0.76)	.76	3.53 (0.76)	3.50 (0.76)	0.04	3.61 (0.74)	.76	3.62 (0.74)	3.59 (0.73)	0.05	3.26 (0.83)	.78	3.28 (0.83)	3.24 (0.84)	0.05	
(Agreeableness)																
Forgiveness	2.75 (0.82)	.74	2.71 (0.80)	2.82 (0.84)	-0.13	2.86 (0.78)	.69	2.83 (0.76)	2.92 (0.80)	-0.12	2.42 (0.83)	.78	2.42 (0.81)	2.41 (0.84)	0.01	
Gentleness	3.22 (0.72)	.66	3.21 (0.71)	3.22 (0.74)	-0.01	3.35 (0.81)	.78	3.34 (0.80)	3.36 (0.84)	-0.02	2.95 (0.81)	.72	2.99 (0.79)	2.92 (0.82)	0.09	
Flexibility	2.79 (0.74)	.61	2.78 (0.74)	2.81 (0.73)	-0.04	2.95 (0.87)	.77	2.99 (0.85)	2.86 (0.88)	0.15	2.71 (0.75)	.64	2.75 (0.74)	2.68 (0.75)	0.09	
Patience	3.15 (0.88)	.79	3.09 (0.86)	3.26 (0.92)	-0.19	3.34 (0.84)	.76	3.33 (0.81)	3.34 (0.89)	0.00	3.04 (0.90)	.80	2.97 (0.87)	3.10 (0.92)	-0.14	
(Conscientiousness)																
Organization	3.28 (0.93)	.74	3.34 (0.94)	3.16 (0.91)	0.20	3.33 (0.91)	.77	3.44 (0.90)	3.13 (0.91)	0.34	3.36 (0.88)	.73	3.45 (0.89)	3.27 (0.86)	0.21	
Diligence	3.79 (0.69)	.70	3.84 (0.68)	3.69 (0.71)	0.21	3.80 (0.74)	.76	3.87 (0.70)	3.66 (0.79)	0.29	3.79 (0.73)	.71	3.81 (0.72)	3.77 (0.74)	0.06	
Perfectionism	3.53 (0.77)	.69	3.60 (0.76)	3.39 (0.78)	0.27	3.45 (0.81)	.79	3.60 (0.75)	3.20 (0.84)	0.50	3.55 (0.76)	.69	3.59 (0.74)	3.51 (0.77)	0.12	
Prudence	3.20 (0.74)	.69	3.24 (0.71)	3.13 (0.78)	0.15	3.23 (0.78)	.72	3.31 (0.75)	3.09 (0.81)	0.27	3.40 (0.75)	.70	3.36 (0.74)	3.44 (0.75)	-0.10	
(Openness to Experience)																
Aesthetic Appreciation	3.27 (0.89)	.66	3.38 (0.86)	3.08 (0.92)	0.34	3.01 (0.90)	.68	3.13 (0.87)	2.79 (0.91)	0.37	3.52 (0.82)	.65	3.64 (0.80)	3.41 (0.83)	0.29	
Inquisitiveness	3.09 (0.91)	.66	2.97 (0.89)	3.30 (0.89)	-0.36	2.91 (0.88)	.65	2.80 (0.85)	3.11 (0.89)	-0.35	3.84 (0.80)	.70	3.64 (0.84)	4.04 (0.71)	-0.52	
Creativity	3.53 (0.90)	.75	3.54 (0.91)	3.50 (0.88)	0.04	3.47 (0.84)	.73	3.55 (0.83)	3.32 (0.85)	0.28	3.72 (0.84)	.73	3.72 (0.86)	3.72 (0.82)	0.00	
Unconventionality	3.40 (0.65)	.52	3.36 (0.64)	3.48 (0.66)	-0.19	3.16 (0.66)	.45	3.12 (0.63)	3.21 (0.69)	-0.13	3.69 (0.67)	.59	3.61 (0.68)	3.76 (0.66)	-0.22	
(Interstitial Scale)																
Altruism	3.89 (0.66)	.59	4.03 (0.60)	3.62 (0.68)	0.64	3.79 (0.68)	.62	3.89 (0.65)	3.61 (0.70)	0.43	3.76 (0.74)	.66	3.97 (0.66)	3.56 (0.75)	0.57	

Figure 42: Loadings of HEXACO-100 Facet Scales on Six Varimax-Rotated Components.

	Honesty-Humility			Emotionality			Extraversion			Agreeableness			Conscientiousness			Openness to Experience		
	St: Self	St: Obs.	On: Self	St: Self	St: Obs.	On: Self	St: Self	St: Obs.	On: Self	St: Self	St: Obs.	On: Self	St: Self	St: Obs.	On: Self	St: Self	St: Obs.	On: Self
Sincerity	.72	.73	.78	-.15	-.17	-.04	.02	-.08	-.05	.00	.06	.04	.09	.11	.05	-.01	.04	.03
Fairness	.64	.67	.68	.21	.19	.17	-.03	.04	.10	.11	.13	.17	.30	.31	.27	.00	.03	.02
Greed Avoidance	.67	.72	.75	-.02	.02	-.02	-.10	-.07	-.08	.16	.13	.18	-.07	.00	-.04	.24	.21	.13
Modesty	.65	.65	.70	.20	.16	.20	-.09	.02	-.11	.21	.36	.32	-.08	.00	-.05	-.06	.00	-.06
Fearfulness	-.10	-.06	.01	.67	.68	.64	-.24	-.21	-.27	.02	.04	.04	.14	.18	.05	-.17	-.14	-.20
Anxiety	.02	-.02	-.06	.57	.65	.64	-.35	-.31	-.42	-.28	-.16	-.21	.15	.24	.08	.05	.08	.03
Dependence	-.01	.02	.01	.75	.79	.75	.10	.11	.12	-.08	-.06	-.04	-.04	-.05	-.13	-.03	.03	-.03
Sentimentality	.19	.21	.28	.78	.78	.74	.13	.13	.09	.02	.10	.10	.00	.04	-.02	.02	.11	.09
Social Self-Esteem	-.06	-.02	.01	-.09	-.16	-.22	.71	.73	.71	.11	.10	.15	.23	.18	.21	-.07	-.11	-.03
Social Boldness	-.06	-.06	-.09	-.16	-.16	-.07	.70	.75	.74	-.17	-.16	-.17	.06	-.02	.00	.19	.20	.19
Sociability	-.06	-.07	-.11	.26	.18	.32	.70	.79	.72	.05	.10	.12	-.06	-.13	-.12	.03	.04	.02
Livelihood	.02	.06	.05	.01	.03	-.06	.78	.76	.79	.20	.25	.19	.05	.04	.13	-.02	.06	.01
Forgiveness	.21	.09	.27	-.09	-.09	.00	.18	.11	.18	.61	.74	.63	.02	-.01	-.08	.07	.10	.08
Gentleness	.18	.21	.22	.06	.03	.09	.05	.09	.00	.73	.77	.76	-.04	-.03	-.10	.03	.06	.03
Flexibility	.00	.14	.15	.04	.07	.08	-.05	-.01	.06	.74	.78	.74	-.02	-.01	.03	-.02	.01	-.01
Patience	.07	.10	.03	-.13	-.06	-.21	.06	.06	.03	.78	.81	.78	.11	.14	.13	.07	.04	.07
Organization	-.01	.00	.03	.06	.08	.01	.11	-.01	.15	.05	.05	.00	.69	.74	.69	-.12	-.07	-.19
Diligence	.11	.15	.06	.03	.08	-.02	.32	.30	.37	-.10	-.04	-.07	.71	.72	.65	.13	.16	.19
Perfectionism	.06	.07	.01	.14	.19	.14	.00	-.02	-.15	-.12	-.07	-.12	.74	.80	.69	.12	.15	.15
Prudence	.04	.17	.08	-.04	-.05	-.21	-.10	-.12	-.03	.19	.15	.17	.74	.75	.73	-.04	-.04	-.02
Aesthetic Appreciation	.11	.15	.17	.13	.17	.15	-.09	-.08	-.02	.08	.13	.13	.07	.11	.09	.79	.78	.71
Inquisitiveness	.01	.04	.03	-.21	-.23	-.24	-.08	.00	.02	.06	.02	.02	.12	.20	.13	.64	.70	.64
Creativity	.06	.13	.03	.09	.18	.08	.18	.17	.16	.02	.06	.02	-.07	-.07	-.03	.70	.68	.73
Unconventionality	-.02	.00	-.04	-.09	-.03	-.06	.03	.07	.01	-.02	.03	.00	-.06	-.06	-.11	.76	.77	.78
Altruism	.37	.45	.46	.49	.38	.47	.22	.21	.20	.27	.41	.37	.17	.14	.08	.13	.15	.15

Note. St: Self = Student sample: Self-reports (N = 2,848); St: Obs. = Student sample: Observer reports (N = 2,843); On: Self = Online sample: Self-reports (N = 100,318). Absolute factor loadings that are greater than .30 are shown in bold; see text for expected loadings of Altruism facet.



Figure 43: Correlations Among the HEXACO-100 Factor Scales.

	1	2	3	4	5	6
Student sample: Self-reports (N = 2,868)						
1. Honesty-Humility	1.00					
2. Emotionality	.13	1.00				
3. Extraversion	-.08	-.10	1.00			
4. Agreeableness	.30	-.14	.13	1.00		
5. Conscientiousness	.15	.13	.17	.06	1.00	
6. Openness	.14	-.07	.05	.10	.04	1.00
Student sample: Observer reports (N = 2,863)						
1. Honesty-Humility	1.00					
2. Emotionality	.15	1.00				
3. Extraversion	-.02	-.11	1.00			
4. Agreeableness	.39	-.02	.15	1.00		
5. Conscientiousness	.27	.22	.04	.09	1.00	
6. Openness	.24	.07	.13	.15	.14	1.00
Online sample: Self-reports (N = 100,318)						
1. Honesty-Humility	1.00					
2. Emotionality	.17	1.00				
3. Extraversion	-.03	-.16	1.00			
4. Agreeableness	.42	-.05	.17	1.00		
5. Conscientiousness	.14	-.06	.17	.03	1.00	
6. Openness	.12	-.05	.13	.12	.07	1.00
Online sample: Excluding media-directed respondents (N = 8,233)						
1. Honesty-Humility	1.00					
2. Emotionality	.11	1.00				
3. Extraversion	-.05	-.12	1.00			
4. Agreeableness	.28	-.17	.20	1.00		
5. Conscientiousness	.17	-.05	.15	.02	1.00	
6. Openness	.16	-.08	.08	.11	.04	1.00

Figure 44: Self/Observer Agreement for HEXACO-100 Factor and Facet Scales.

	<i>r</i>		<i>r</i>
Honesty–Humility	.46	Agreeableness	.47
Sincerity	.20	Forgiveness	.35
Fairness	.45	Gentleness	.35
Greed Avoidance	.47	Flexibility	.35
Modesty	.30	Patience	.43
Mean WFCC/mean WFDC	.36/.19	Mean WFCC/mean WFDC	.37/.25
Emotionality	.61	Conscientiousness	.52
Fearfulness	.51	Organization	.52
Anxiety	.40	Diligence	.37
Dependence	.44	Perfectionism	.42
Sentimentality	.47	Prudence	.33
Mean WFCC/mean WFDC	.46/.30	Mean WFCC/mean WFDC	.41/.25
Extraversion	.56	Openness to Experience	.56
Social Self-Esteem	.38	Aesthetic Appreciation	.49
Social Boldness	.53	Inquisitiveness	.45
Sociability	.45	Creativity	.50
Liveliness	.45	Unconventionality	.36
Mean WFCC/mean WFDC	.45/.28	Mean WFCC/mean WFDC	.45/.26
Interstitial facet			
Altruism	.36		

Note. *N* = 2,863. WFCC = within-factor convergent correlation (self/observer correlation for same facet scale); WFDC = within-factor discriminant correlation (self/observer correlation for different facet scales within same factor).

Figure 45: The Big Seven structure of the Chinese personality (QZPS)

-
1. **WX: Extraversion**
 Extraversion reflects activity, initiative, positivity, mild characteristics in socialization, easy-going nature and ease in communication, a happy and positive mood. WX has three subfactors:
 WX1 – Active: active and sociable. People with high scores are active, positive, lively, natural and have high coordination skills.
 WX2 – Gregariousness: affinity. People with high scores are cordial, gentle and well liked.
 WX3 – Optimistic: happy and positive. People with high scores are positive and energized.
 2. **SL: Kindness**
 The ‘good person’ in Chinese culture, showing honest, forgiving, caring, trustworthy, righteous and affectionate characteristics. People with high scores are honest, kind, caring, trustworthy and affectionate. SL includes three subfactors:
 SL1 – Altruistic: friendly and caring about others. People with high scores are forgiving, friendly and caring about others.
 SL2 – Honest: honest and credible. People with high scores are honest and true to their words.
 SL3 – Affectionate: the degree to which one emphasizes feelings vs personal interests. People with high scores are affectionate and righteous.
 3. **XF: Behavior styles**
 The way one behaves and his/her attitude. People with high scores are serious, meticulous, thoughtful, clear about goals, practical, obeying rules and cooperative. XF has three subfactors:
 XF1 – Rigorous: describes work attitudes and self-constraints. People with high scores are serious, steady and rigorous.
 XF2 – Self-constrained: cooperative and law-abiding. People with high scores are self-constrained, law-abiding, cooperative, uninterested in fame and wealth.
 XF3 – Composed: composed. People with high scores are meticulous and thoughtful.
 4. **CG: Talents**
 The ability and work attitudes of an individual. People with high scores are not afraid of difficulties, are persistent, involved, and are not afraid to undertake difficult assignments. CG has three subfactors:
 CG1 – Decisive: the ability to make a decision. People with high scores are not afraid of difficulties, decisive, capable of quick thinking and are of a strong character.
 CG2 – Persistent: persistent in work. People with high scores have clear goals, abide by their principles and are persistent.
 CG3 – Alert and Resourceful: Assertiveness and alert. People with high scores are involved with work, dare to do what they think is right and are active and quick.
 5. **QX: Emotionality**
 The stability of one’s emotions in working and interpersonal situations. People with high scores are impetuous, impulsive and cannot control their emotions easily. QX has two subfactors:
 QX1 – Patient: the control and expression of one’s emotions. People with high scores are emotionally stable and mild, and can control their emotions well.
 QX2 – Candid: candid characteristics of emotion. People with high scores are frank and outspoken, impetuous and have difficulty controlling their emotions.
 6. **RG: Human relations**
 The basic attitude toward human relations. People with high scores are friendly and mild, altruistic and easy to communicate with. RG has two subfactors:
 RG1 – Generous: the basic attitude toward human relations. People with high scores are mild, friendly, generous and self-content.
 RG2 – Warm: the characteristics of human relations. People with high scores are active, positive, mature and persistent in communication.
 7. **CT: Ways of life**
 The fundamental attitude of the individual toward life and career. People with high scores are goal-oriented, persistent, have clear visions of the future, are assertive about the future, and aspire to excellence. CT has two subfactors:
 CT1 – Assertiveness: career ambition. People with high scores are assertive about life and the future, and work actively toward goals.
 CT2 – Not Seeking Fame and Wealth: attitudes toward achievement and success. People with high scores are satisfied with their current situations and have no clear goals or ambitions for the future, and lead a peaceful life without secular desires.
-

Figure 46: Comparison of Chinese and Western personality structures

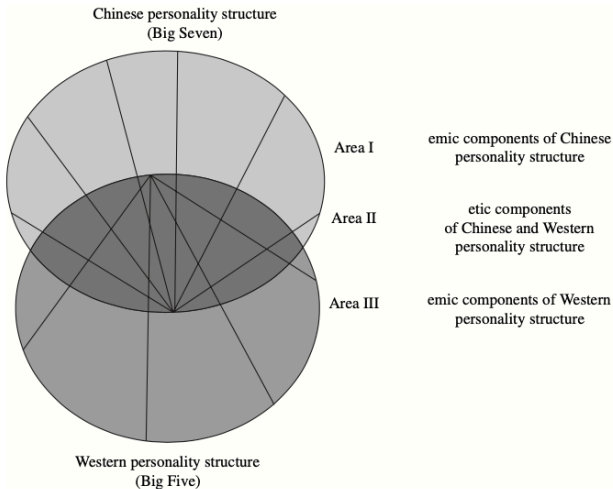


Figure 47: Factor loadings of the seven-factor structure based on subfactors and facets of NEO PI-R and QZPS

	1	2	3	4	5	6	7
N3 Depressive	0.82						
N1 Anxious	0.79						
N4 Self-conscious	0.76						
N2 Angry/hostile	0.67			0.46			
N6 Vulnerability	0.65						
N5 Impulsive	0.53		0.39				
A5 Modesty	0.38	-0.38					
CG1 Decisive	-0.46				-0.37		
E2 Gregariousness	-0.66						
WE3 Optimistic	-0.69						
WX1 Activity		0.67					
E5 Excitement-seeking		0.60	0.37				
RG2 Warmth		0.52					
E3 Assertiveness		0.50					
E4 Activity		0.47		0.38			
E1 Warmth		0.42			0.41		
RG1 Generous		-0.45		-0.40			
SL1 Altruistic		-0.46					0.41
SL2 Honest		-0.50	-0.48				
SL3 Affectionate		-0.61					
A2 Straightforwardness		-0.74					
O1 Fantasy			0.58				
E6 Positive emotions			0.57				
O6 Values			0.55				
O2 Aesthetics			0.46				
O5 Ideas			0.42				0.37
O3 Feelings	0.35		0.41			0.37	
XF3 Composed			-0.48	-0.45			
CG2 Persistent			-0.54				
XF1 Rigorous		-0.35	-0.58				
XF2 Self-constrained			-0.60				
QX2 Candid				0.80			
QX1 Patient				-0.78			
A3 Altruism					0.59		
A6 Tender-mindedness					0.56		
A1 Trustworthy					0.54		
C3 Dutifulness					0.50	0.38	
O4 Actions			0.39		-0.50		
C5 Self constrained							0.59
C4 Desire for success							0.59
C1 Ability							0.50
C6 Deliberation							0.49
C2 Order							0.44
WX2 Gregariousness	-0.44						-0.48
CT1 Assertiveness							0.77
CG3 Alert/Resourceful							0.57
A4 Compliance				-0.45			-0.47
CT2 Not seeking fame and wealth							-0.67



Psychopathological Measures

Figure 48: Mean Correlations of Psychopathological Measures with the Big Five Traits

FFM Facet		Paranoid	Schizoid	Schizotypal	Antisocial	Borderline	Histrionic	Narcissistic	Avoidant	Dependent	Obsessive
N	Anxiousness	0.27	0.13	0.27	0.00	0.38	0.00	0.02	0.41	0.39	0.16
	Angry hostility	0.41	0.19	0.29	0.27	0.48	0.08	0.23	0.29	0.18	0.10
	Depressiveness	0.35	0.28	0.39	0.12	0.50	-0.06	0.03	0.53	0.41	0.09
	Self-consciousness	0.29	0.23	0.32	0.02	0.35	-0.11	-0.03	0.56	0.42	0.13
	Impulsiveness	0.15	0.00	0.17	0.27	0.34	0.17	0.14	0.14	0.17	-0.07
E	Vulnerability	0.22	0.14	0.25	0.04	0.39	0.01	-0.01	0.40	0.43	0.03
	Warmth	-0.28	-0.42	-0.28	-0.13	-0.20	0.26	-0.07	-0.35	-0.03	-0.07
	Gregariousness	-0.20	-0.48	-0.25	0.02	-0.12	0.35	0.04	-0.42	-0.03	-0.16
	Assertiveness	-0.08	-0.22	-0.13	0.06	-0.09	0.27	0.19	-0.39	-0.21	-0.01
	Activity	-0.08	-0.25	-0.13	0.02	-0.10	0.25	0.09	-0.29	-0.12	0.03
O	Excitement seeking	-0.01	-0.21	-0.04	0.25	0.06	0.27	0.16	-0.23	-0.06	-0.12
	Positive emotions	-0.27	-0.38	-0.26	-0.09	-0.26	0.23	-0.02	-0.39	-0.15	-0.09
	Fantasy	0.00	-0.05	0.14	0.10	0.13	0.16	0.11	0.00	0.05	-0.09
	Aesthetics	-0.05	-0.06	0.07	0.00	0.05	0.10	0.04	-0.03	0.01	0.01
	Feelings	-0.02	-0.17	0.03	-0.02	0.09	0.18	0.05	-0.04	0.05	0.01
A	Actions	-0.10	-0.13	-0.06	0.10	-0.03	0.12	0.04	-0.20	-0.13	-0.12
	Ideas	-0.03	0.00	0.09	0.04	-0.01	0.04	0.07	-0.05	-0.12	0.03
	Values	-0.05	-0.05	0.01	0.08	0.05	0.04	-0.01	-0.05	-0.04	-0.09
	Trust	-0.45	-0.28	-0.31	-0.22	-0.29	0.05	-0.20	-0.29	-0.07	-0.08
	Straightforwardness	-0.24	-0.09	-0.16	-0.37	-0.21	-0.10	-0.31	-0.06	0.00	0.04
C	Altruism	-0.21	-0.19	-0.15	-0.24	-0.18	0.02	-0.20	-0.12	0.03	0.04
	Compliance	-0.27	-0.08	-0.13	-0.32	-0.27	-0.12	-0.26	-0.02	0.10	0.01
	Modesty	-0.06	0.08	0.05	-0.17	0.03	-0.16	-0.37	0.20	0.16	0.02
	Tender-mindedness	-0.18	-0.11	-0.05	-0.19	-0.09	0.02	-0.17	-0.02	0.09	0.00
	Competence	-0.13	-0.13	-0.18	-0.21	-0.29	-0.01	0.01	-0.23	-0.25	0.19
	Order	0.00	-0.02	-0.06	-0.18	-0.10	-0.05	-0.03	-0.03	-0.06	0.25
	Dutifulness	-0.10	-0.08	-0.10	-0.29	-0.22	-0.08	-0.10	-0.09	-0.08	0.25
	Achievement striving	-0.07	-0.13	-0.13	-0.19	-0.19	0.04	0.02	-0.19	-0.16	0.25
	Self-discipline	-0.14	-0.12	-0.18	-0.25	-0.29	-0.04	-0.09	-0.22	-0.23	0.21
	Deliberation	-0.09	-0.02	-0.10	-0.38	-0.27	-0.16	-0.13	-0.01	-0.06	0.24

Note: All values larger than $r = 0.04$ are significant at $p < 0.05$; correlations larger than 0.20 are marked in boldface type.
 Source: Reproduced from Samuel and Widiger (2008).

Economics Preferences

Figure 49: Measures of Standard Preference Parameters and Analogous Measures in the Psychology Literature

Preference	Survey Questions and Experiments Used to Elicit Preference	Overview of Relationship to Personality Measures
<p><i>Time preference:</i> Preference over consumption in different time periods</p>	<p><i>Delay discounting:</i> A participant is given a series of choices for whether he would prefer to receive smaller payments sooner versus larger payments later. The amounts and times vary across choices. The choices can be over hypothetical payoffs or real-stakes payoffs (see, e.g., Dohmen et al., 2011).</p> <p><i>Marshmallow task:</i> A participant (usually a child) is given a marshmallow. The experimenter leaves the room and tells the participant that he will receive a second marshmallow if he resists consuming the marshmallow until the experimenter returns. The length of time that the participant waits is a measure of short-term discounting (see, e.g., Mischel et al., 2010).</p> <p><i>Example survey question:</i> "How patient are you on a scale from 1 to 10?" (see GSOEP, 2008).</p>	<p><i>Conceptual relationships:</i> Conscientiousness, Self-Control, Affective Mindfulness, Consideration of Future Consequences, Elaboration of Consequences, Time Preference.</p> <p><i>Empirical relationships:</i> Conscientiousness, Self-Control, Affective Mindfulness, Elaboration of Consequences, Consideration of Future Consequences (Daly, Delaney, and Harmon, 2009).</p> <p>Extraversion, Time Preference (Dohmen, Falk, Huffman, and Sunde, 2010).</p> <p>Agreeableness, Inhibitive Side of Conscientiousness (Anderson, Burks, DeYoung, and Rustichini, 2011).</p>

Continued

Figure 50: Measures of Standard Preference Parameters and Analogous Measures in the Psychology Literature

Preference	Survey Questions and Experiments Used to Elicit Preference	Overview of Relationship to Personality Measures
<p><i>Risk aversion:</i> Preference over different states of the world</p>	<p><i>Lottery choice task:</i> A participant is given a series of choices between a safe amount of money and a lottery. The lottery remains the same across choices, whereas the safe amount varies. The lowest safe amount for which the participant prefers the lottery is a measure of risk aversion. The choices can be over hypothetical payoffs or real-stakes payoffs (see, e.g., Dohmen et al., 2011).</p> <p><i>Devil's Task (Slovic's risk task):</i> A participant sequentially chooses between ten "switches" or urns associated with hidden payoffs. The participant is told that nine of the switches are associated with a reward and one of them results in a loss of all previous winnings. Once a participant chooses a switch, he cannot flip the same switch again. The participant can elect to stop picking switches at any time. The number of switches chosen is a measure of risk aversion (see, e.g., Slovic, 1966).</p> <p><i>Balloon Analogue Risk Task (BART):</i> The participant is given a computerized task in which he is presented with a series of "balloons" that can be inflated by "pumping" the balloon. The participant receives potential earnings each time he pumps a balloon. At any point, the participant can stop pumping, realize the potential earnings, and move to the next balloon. After a threshold number of pumps each balloon "explodes," and the participant receives nothing. The threshold varies across balloons, and participants are not told the distribution of thresholds (see, e.g., Lejuez, Aklin, Zvolensky, and Pedulla, 2003).</p> <p><i>Example survey question:</i> "How willing are you to take risks, in general?" (see, e.g., Dohmen et al., 2011).</p>	<p><i>Conceptual relationships:</i> Impulsive Sensation Seeking, Balloon Analogue Risk Task.</p> <p><i>Empirical relationships:</i> Sensation Seeking (Zuckerman, 1994; Eckel and Grossman, 2002).</p> <p>Openness (Dohmen, Falk, Huffman, and Sunde, 2010).</p> <p>Neuroticism, Ambition, Agreeableness (Borghans, Golsteyn, Heckman, and Meijers, 2009).</p> <p>Balloon Analogue Risk Task (Lejuez, Aklin, Zvolensky, and Pedulla, 2003).</p> <p>Neuroticism, Inhibitive Side of Conscientiousness (Anderson, Burks, DeYoung, and Rustichini, 2011).</p>

Continued



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Figure 51: Measures of Standard Preference Parameters and Analogous Measures in the Psychology Literature

Preference	Survey Questions and Experiments Used to Elicit Preference	Overview of Relationship to Personality Measures
<i>Leisure</i> : Preference over consumption and leisure	<i>Payments for working</i> : The participant is given a choice to work at different wages. Their reservation wage is their preference for leisure. The choices can be over hypothetical payoffs or real-stakes payoffs (see, e.g., Borghans, Meijers, and ter Weel, 2008).	<i>Conceptual relationships</i> : Achievement Striving, Endurance, Industriousness. <i>Empirical relationships</i> : Inconsistent with psychological measures of leisure preferences (Borghans, Meijers, and ter Weel, 2008).
<i>Altruism</i> : Unconditional kindness <i>Inequity aversion</i> : Value of equality in payoffs	<i>Dictator game</i> : A “proposer” has the option to transfer part of an endowment to a “responder.” The responder passively receives any transfer. The transfer is used as a measure of pure altruism (see, e.g., Fehr and Schmidt, 2006).	<i>Conceptual relationships</i> : Warmth, Gregariousness, Tender-Mindedness, Hostility (opposite). <i>Empirical relationships</i> : Neuroticism, Agreeableness (Ashton, Paunonen, Helmes, and Jackson, 1998; Osiński, 2009; Bekkers, 2006; Ben-Ner and Kramer, 2011).
<i>Trust</i> : Willingness to make oneself vulnerable to opportunistic individuals	<i>Trust game</i> : An “investor” receives an endowment and can decide to transfer some of it to a “trustee.” The amount transferred increases in value. The trustee can then decide to transfer some back to the investor but has no monetary incentive to do so. The amount the investor transfers to the trustee is used as a measure of trust (see, e.g., Fehr and Schmidt, 2006). <i>Example survey question</i> : “In general, one can trust people” (see, e.g., Dohmen, Falk, Huffman, and Sunde, 2008).	<i>Conceptual relationships</i> : Trust. <i>Empirical relationships</i> : Neuroticism, Agreeableness, Openness, Conscientiousness (Dohmen, Falk, Huffman, and Sunde, 2008).

Continued

Figure 52: Measures of Standard Preference Parameters and Analogous Measures in the Psychology Literature

Preference	Survey Questions and Experiments Used to Elicit Preference	Overview of Relationship to Personality Measures
<p><i>Reciprocity</i>: The way in which one person responds to another's actions.</p> <p><i>Positive reciprocity</i>: Tendency to reward kind actions.</p> <p><i>Negative reciprocity</i>: Tendency to punish others for unkind actions.</p>	<p><i>Ultimatum game</i>: A "proposer" offers part of an endowment to a "responder." The responder can choose to accept the offer in which case both players keep the payoffs, or the responder can choose to reject the offer in which case the players receive nothing. The responder's choice is a measure of reciprocity (Fehr and Schmidt, 2006).</p> <p><i>Trust game</i>: See above description. The trustee's action is used as a measure of reciprocity.</p> <p><i>Gift exchange game</i>: An "employer" proposes a wage and an amount of desired effort to a potential "worker." The worker can either reject the proposal so that no one receives anything or can accept the proposal and choose any amount of effort. The employer receives a payment proportional to the worker's effort net of the wage. The workers action is used as a measure of reciprocity (see, e.g., Fehr and Schmidt, 2006).</p> <p><i>Example survey question (positive reciprocity)</i>: "If someone does me a favor, I am prepared to return it." (see, e.g., Dohmen, Falk, Huffman, and Sunde, 2008).</p> <p><i>Example survey question (negative reciprocity)</i>: "If I suffer a serious wrong, I will take revenge as soon as possible, no matter the cost." (see, e.g., Dohmen, Falk, Huffman, and Sunde, 2008).</p>	<p><i>Conceptual relationships</i>: Warmth, Gregariousness, Hostility (opposite).</p> <p><i>Empirical relationships</i>: Neuroticism, Agreeableness, Conscientiousness (Dohmen, Falk, Huffman, and Sunde, 2008).</p>

Figure 53: Overview: Experimental Measures

Preference	Experiment	Measure
Risk taking	Two multiple price lists in which subjects choose between a lottery and varying safe options.	Average of rows in both price lists in which subjects switch from preferring the lottery to the safe option.
Time discounting	Two multiple price lists in which subjects choose between a payment "today" and a larger payment "in 12 months".	Average of rows in two price lists in which subjects switch from preferring the early to the delayed payment.
Trust	First mover behavior in two investment games.	Average amount sent as a first mover in both investment games.
Altruism	First mover behavior in a dictator game with a charitable organization as recipient.	Amount of donation.
Positive reciprocity	Second mover behavior in two investment games (contingent response method).	Average amount sent back in both investment games.
Negative reciprocity	Investment into punishment after unilateral defection of the opponent in a prisoner's dilemma (contingent response method) and minimum acceptable offer in an ultimatum game.	Average score: amount invested into punishment and minimum acceptable offer in an ultimatum game.

Figure 54: The Preference Module

Preference		Item description	Weights
Risk	R2	Multiple price list (31 hypothetical choices between a lottery and a safe option).	0.2758
Taking	R3	Are you a person who is generally willing to take risks, or do you try to avoid taking risks?	0.2034
Time	D2	List of 25 hypothetical choices between an early payment "today" and a delayed payment "in 12 months".	0.4849
Discounting	D4	In comparison with others, are you a person who is generally willing to give up something today in order to benefit from that in the future?	-0.1712
Trust	T24	Hypothetical investment game: first mover behavior.	0.6289
	T16	Self-assessment: As long as I am not convinced otherwise, I assume that people have only the best intentions.	0.1331
Altruism	A11	You won 1,000 euros in a lottery. Considering your current situation, how much would you donate to charity?	0.1845
	A10	How do you assess your willingness to share with others without expecting anything in return when it comes to charity?	0.3210
Positive	PR11	Hypothetical investment game: second mover behavior.	0.4857
Reciprocity	PR9	Hypothetical scenario: Which bottle of wine do you give as a thank-you gift?	0.1640
Negative	NR10	Minimum acceptable offer in hypothetical ultimatum game.	0.3284
Reciprocity	NR1	Are you a person who is generally willing to punish unfair behavior even if this is costly?	0.1479

Notes. The second column displays the item number as listed in Section G in the online appendix. See Section B in the online appendix for the exact wordings of the survey questions. The weights shown in the final column are OLS coefficients in a regression of the standardized experimental measure on the standardized module items. The survey measure for each preference is constructed by multiplying the items by the weights and adding. For details see the regression tables in Section C in the online appendix. Section D lists the survey items with the highest correlations with the experimental measure for each preference.



Figure 55: The GPS Module

Preference	Item description	Weights
Risk taking	1. Staircase measure (five interdependent choices between a lottery and a safe option).	0.2159
	2. Please tell me, in general, how willing or unwilling you are to take risks.	0.2406
Time discounting	1. Staircase measure (five interdependent choices between an early and a delayed amount of money).	0.4417
	2. How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?	0.1791
Trust	1. I assume that people have only the best intentions.	0.2656
Altruism	1. Hypothetical donation.	0.1845
	2. How willing are you to give to good causes without expecting anything in return?	0.3210
Positive reciprocity	1. Hypothetical choice: size of a "thank-you" gift.	0.2876
	2. When someone does me a favor I am willing to return it.	0.2705
Negative reciprocity	1. If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so.	0.0884
	2. How willing are you to punish someone who treats you unfairly, even if there may be costs for you?	0.0741
	3. How willing are you to punish someone who treats others unfairly, even if there may be costs for you?	0.0741

Notes. The second column displays the items as they were adapted to serve the purpose of the GPS study. Online Appendix Section E describes how the wordings etc. were adjusted. The weights shown in the last column are coefficients resulting from OLS regressions using the items with the original wording from the validation sample. The survey measure for each preference can be constructed by multiplying the items by the weights and adding.

Table 2: Other-regarding Preference and Measurements

Other-regarding Preference	Survey Questions and Experiments Used to Elicit Preference
<p>Egalitarianism: Egalitarian types prefer allocations that yield equal payoffs for both parties over those with unequal payoffs.</p>	<p>Three simple allocation tasks: The prosocial game which choose between the allocation (1,1) - 1 point for the decision maker, 1 point for the recipient - and the allocation (1,0). The envy game which choose between the allocation (1,1) and (1,2). And the sharing game which choose between the allocation (1,1) and (2,0).</p>
<p>Altruism: Altruistic types value the other person's payoff or the joint payoff positively, and spiteful types put a negative value on the other person's payoff.</p>	<p>Strongly egalitarian subjects pick the egalitarian allocation (1,1) in all three games. Weakly egalitarian subjects choose the egalitarian allocation in all games except the sharing game, where egalitarian behavior is costly. Strongly altruistic subjects always select the allocation that maximizes the partner's payoff and at the same time the joint payoff. Weakly altruistic subjects opt for the allocation that maximizes the partner's payoff and the joint payoff in all games except the sharing game. Finally, spiteful subjects always prefer the allocation that minimizes the partner's payoff or maximizes the positive difference in own versus partner's payoff. (Fehr et al. 2008, Fehr 2008, Egalitarianism and Fehr et al. 2013)</p>
<p>Spite: A human trait that puts negative value on the other person's well-being.</p>	
<p>Parochialism: A potentially harmful downside of other-regarding preferences. In-group favoritism and out-group hostility.</p>	



Figure 56: Definition of other-regarding preference types.

Type	Prosocial game	Envy game	Sharing game
Strongly egalitarian	(1/1)	(1/1)	(1/1)
Weakly egalitarian	(1/1)	(1/1)	(2/0)
Strongly altruistic	(1/1)	(1/2)	(1/1)
Weakly altruistic	(1/1)	(1/2)	(2/0)
Spiteful	(1/0)	(1/1)	(2/0)

Figure 57: The relative frequency of egalitarian choices across games and age groups.

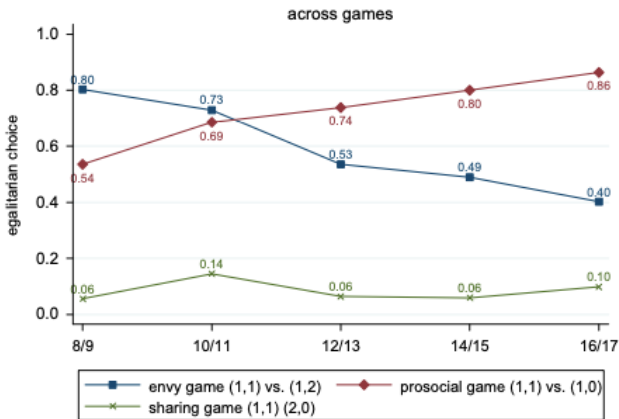


Figure 58: The relative frequency of egalitarian choices in in-group and out-group condition. (a) Prosocial game: (1,1) vs (1,0), (b) envy game: (1,1) vs (1,2) and (c) sharing game: (1,1) vs (2,0).

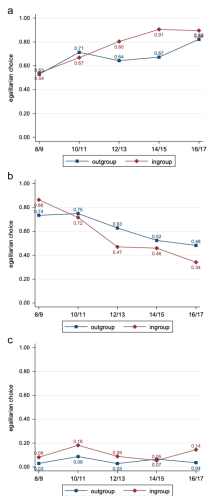


Figure 59: The relative frequency of egalitarian choices of males and females. (a) Prosocial game: (1,1) vs (1,0), (b) envy game: (1,1) vs (1,2) and (c) sharing game: (1,1) vs (2,0).

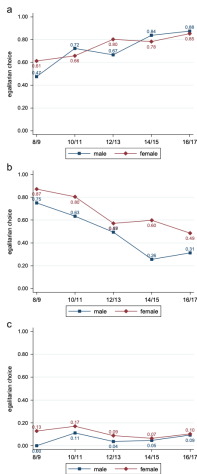


Figure 60: Behavioral types and parochialism.

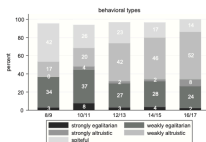


Fig. 4. Behavioral types across age groups.

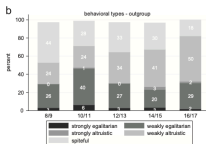
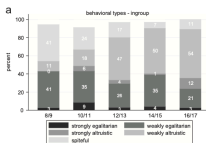


Figure 61: Behavioral types and gender.

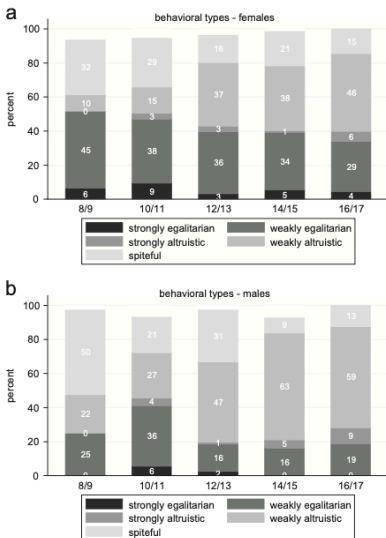


Table 3: Consistency with utility maximization

Consistency with Utility Maximization

The ability to make rational decisions, which is closely related to intelligence.

Consistency scores vary markedly within and across socioeconomic groups. In particular, consistency is strongly related to wealth: A standard deviation increase in consistency is associated with 15–19 percent more household wealth (Choi et al. 2014).

Survey Questions and Experiments Used to Elicit Preference

Choi et al. (2014) measure the decision-making quality in the experiment by evaluating the consistency of individual choices with the Generalized Axiom of Revealed Preference (GARP). They assess how nearly individual behavior complies with GARP using standard measures of consistency that have been proposed for quantifying the extent of violations.

Individuals face a sequence of decision problems under risk. Each decision problem was presented as a choice from a two-dimensional budget line. A choice of the allocation from the budget line represents an allocation of points between accounts x and y (corresponding to the horizontal and vertical axes). The actual payoffs of a particular choice were determined by the allocation to the x and y accounts; the subject received the points allocated to one of the accounts x or y , determined at random and equally likely. The point C , which lies on the 45-degree line, corresponds to the equal allocation with certain outcome, whereas points A and B represent allocations in which all points are allocated to one of the accounts. The points along AC are risky—they have a lower payoff in state x and a higher payoff in state y —but because the slope of the budget line AB is steeper than negative one, they have higher expected return than point C . (Choi et al. 2014)choi2014more



Figure 62: An Illustration of the Budget Line

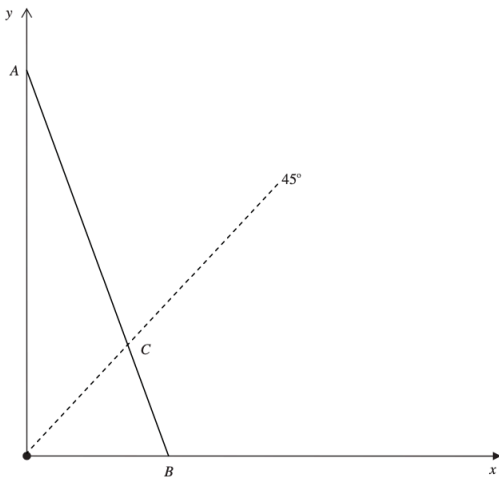


Figure 63: The Construction of the CCEI for a Simple Violation of GARP

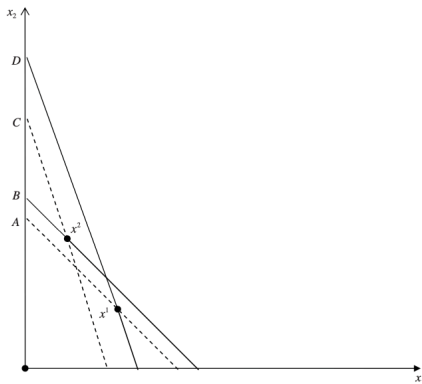


FIGURE 2. THE CONSTRUCTION OF THE CCEI FOR A SIMPLE VIOLATION OF GARP

Notes: Here we have a violation of the Weak Axiom of Revealed Preference (WARP) since x^1 is directly revealed preferred to x^2 and x^2 is directly revealed preferred to x^1 . A perturbation $A/B < C/D$ of the budget line through allocation x^1 removes the violation.

Figure 64: Mean CCEI Scores

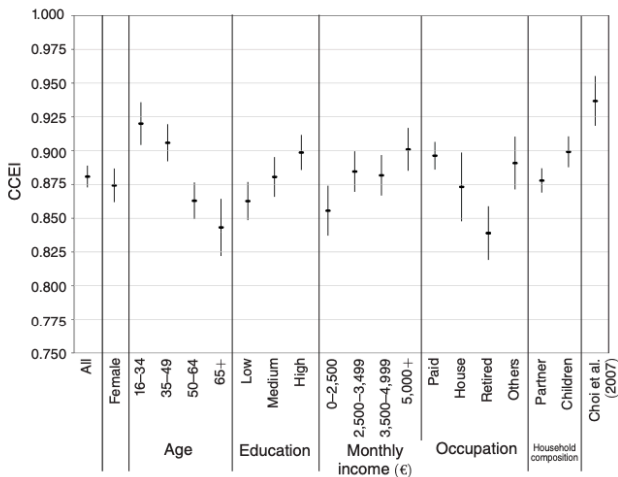


Figure 65: A Violation of GARP Involving the Mirror-Image Budget Line

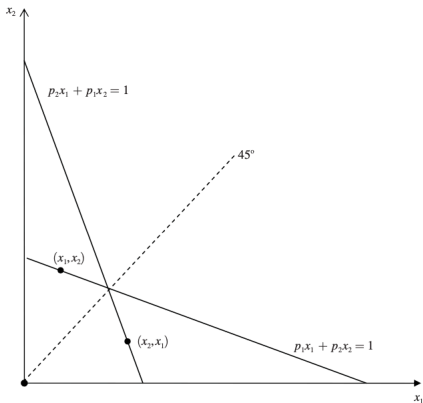


FIGURE 4. A VIOLATION OF GARP INVOLVING THE MIRROR-IMAGE BUDGET LINE

Notes: An individual choosing allocation (x_1, x_2) subject to budget constraint $p_1x_1 + p_2x_2 = 1$ violates first-order stochastic dominance. This decision generates a violation of the Weak Axiom of Revealed Preference involving the mirror-image decision of choosing (x_1, x_2) subject to budget constraint $p_2x_1 + p_1x_2 = 1$.

Figure 66: The Average Fraction of Tokens Allocated to the Cheaper Asset

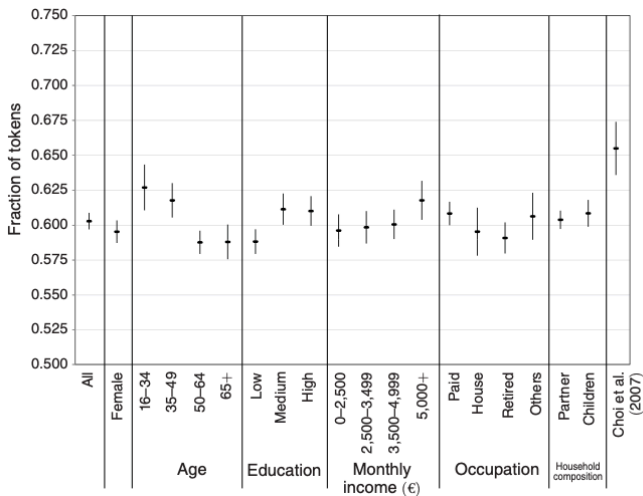


Figure 67: The Relationship between CCEI Scores and Wealth

	(1)	(2)	(3)
CCEI	1.351** (0.566)	1.109** (0.534)	101,888.0* (52,691.9)
log 2008 household income	0.584*** (0.132)	0.606*** (0.126)	
2008 household income			1.776*** (0.4)
Female	-0.313* (0.177)	-0.356** (0.164)	-32,484.3* (17,523.9)
Partnered	0.652*** (0.181)	0.595*** (0.171)	46,201.9*** (17,173.7)
Number of children	0.090 (0.093)	0.109 (0.086)	14,078.6* (8,351.5)
Age	-0.303 (0.347)	-0.008 (0.208)	-19,148.5 (30,164.4)
Age ²	0.007 (0.006)	0.002 (0.004)	468.7 (523.6)
Age ³	0.000 (0.000)	0.000 (0.000)	-2.9 (2.9)
<i>Education</i>			
Prevocational	0.269 (0.464)	0.245 (0.462)	14,137.4 (43,449.1)
Preuniversity	0.634 (0.478)	0.562 (0.476)	59,035.0 (44,746.1)
Senior vocational training	0.416 (0.474)	0.421 (0.468)	28,318.7 (42,419.2)
Vocational college	0.490 (0.451)	0.527 (0.449)	31,341.2 (42,046.8)
University	0.725 (0.473)	0.685 (0.465)	77,578.8 (47,709.4)
<i>Occupation</i>			
Paid work	0.206 (0.322)	0.226 (0.321)	-12,657.2 (26,597.8)
House work	0.552 (0.406)	0.603 (0.413)	16,876.8 (31,114.3)
Retired	0.131 (0.318)	0.190 (0.318)	16,753.1 (35,165.2)
Constant	6.292 (6.419)	0.469 (3.598)	76,214.4 (559,677.5)
R ²	0.179	0.217	0.188
Observations	517	566	568

Notes: The groupings of different levels of education are based on the categorization of Statistics Netherlands (Centraal Bureau voor de Statistiek). For a complete description see <http://www.centerdata.nl/en/centerpanel>. Standard errors in parentheses.

*** Significant at the 1 percent level.
 ** Significant at the 5 percent level.
 * Significant at the 10 percent level.