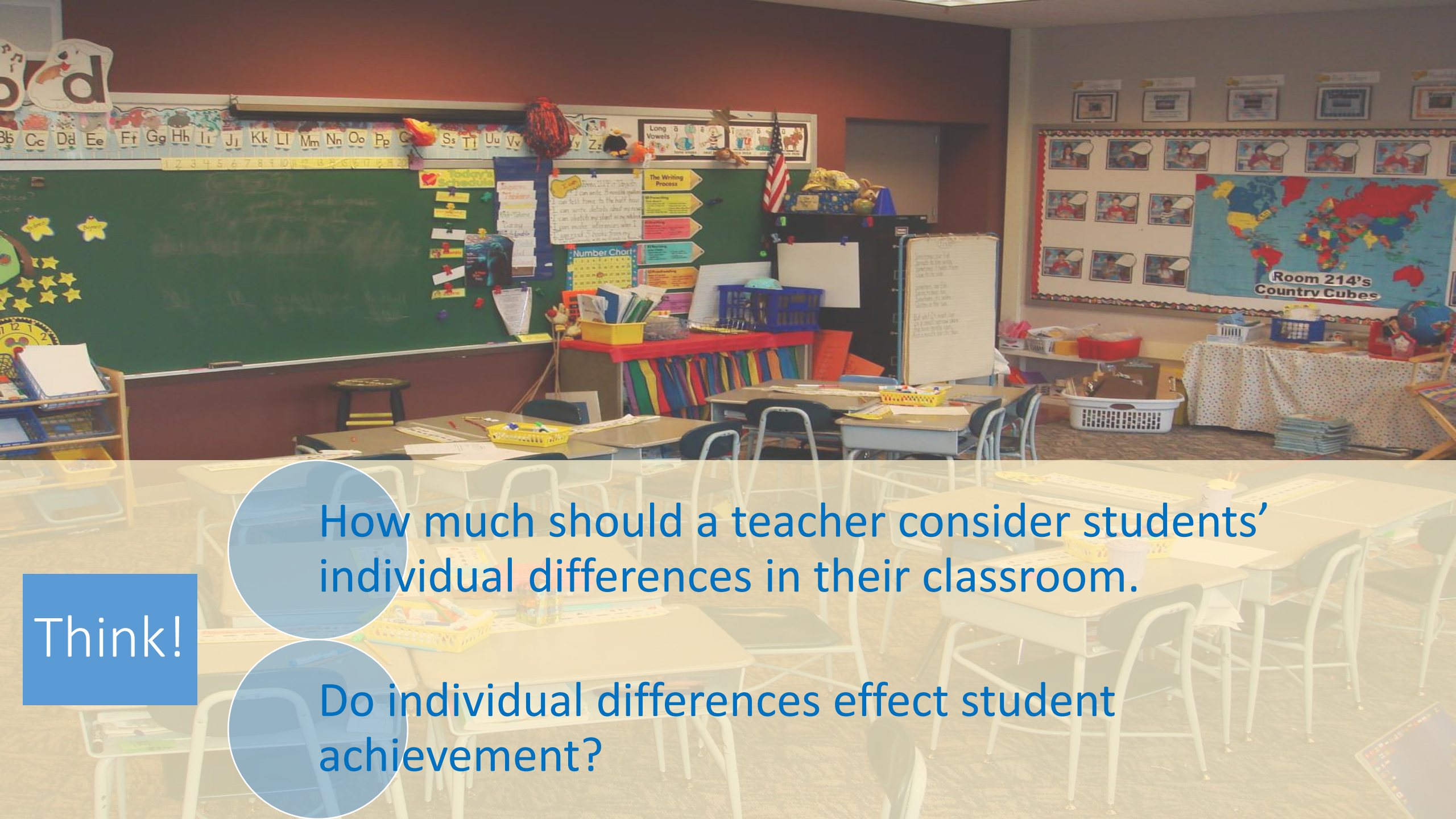




Individual
differences and
achievement



How much should a teacher consider students' individual differences in their classroom.

Think!

Do individual differences effect student achievement?

Personality and intelligence as predictors of academic success



Many predictors of academic achievement have already been investigated, but no source of variance has been found to be as strong as the student him- or herself [Hattie, 2009]

When it comes to the prediction of academic achievement, there is no doubt that general intelligence (g) is the most powerful single predictor (Jensen, 1998; Kuncel, Hezlett, & Ones, 2004).

Correlations between general intelligence and grades most often range from $r = 0.3$ to $r = 0.5$, depending on different factors such as the school subject, years of education, or the selectivity of the sample.

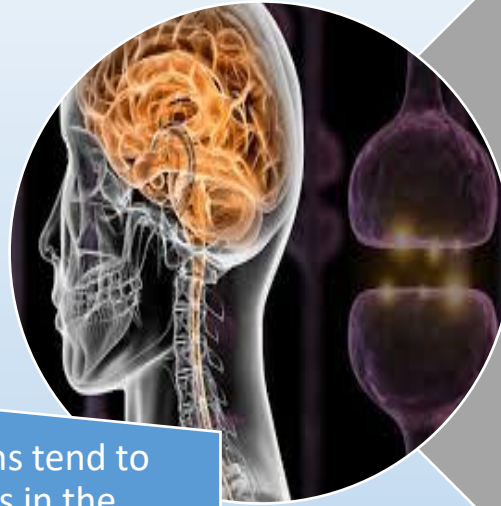
A maximum correlation of $r = 0.5$ means that the predictive power of intelligence never exceeds 25% variance explained.

<https://www.youtube.com/watch?v=Ik8sdMGJ3m4>

Research studies

Cognitive ability is the strongest predictor of academic performance (Jensen, 1998).

Boekaerts (1995) - correlations tend to decline as students progress in the educational system, dropping from about $r=.7$ in elementary school to as little as $r=.4$ in college



Walberg (1984) - meta-analysis of over 3,000 studies = correlation between cognitive ability and academic performance - about .70.

- Similar findings in Gagne & St Pere (2002) .

Among secondary school students, cognitive ability correlates with academic performance in the order of .50 (e.g. [Sternberg et al., 2001](#))

Deary et al (2007)

Five year longitudinal study

- 70,000 English children
- Examined the association between g at age 11 and educational achievement in GCSEs at 16.

Subject	Correlation with g ($r =$)
GCSE total points	0.69
GCSE best 8	0.72
Maths	0.77
Biology	0.51
Chemistry	0.46
Physics	0.50
English	0.67
English Lit	0.59
History	0.63
Geography	0.65
French	0.64
German	0.61
Spanish	0.62
Drama	0.47
Art and Design	0.43
Music	0.54

Duckworth

- Isn't it more than IQ?
- What about motivation?
- One characteristic emerged as a significant predictor of success. And it wasn't social intelligence. It wasn't good looks, physical health, and it wasn't IQ. It was grit

https://www.ted.com/talks/angela_lee_duckworth_grit_the_power_of_passion_and_perseverance/discussion?referrer=playlist-what_is_success&language=en

The continuity of the effect of childhood personality on achievement

Big five personality characteristics

- Neuroticism: emotional stability or neuroticism is the most important aspect of personality comparison
- Extroversion: describes the intensity and quality of an individual's relationship to the environment; Extroverted people seek connection with the environment and are warm, energetic, and sociable (Klinkozs et al.2006).
- Openness to experience: reflects an individual's broad-mindedness, depth of attitude, and penetrable awareness; it is a need for generalizing and testing out experiences.
- Conscientiousness: represents an individual's accountability, academic persistence and ability to organize information (Bratko et al. 2006).
- Agreeableness: this dimension, too, refers to interpersonal relationships and is described by traits such as sympathy, altruism, honesty, sense of cooperation and hospitality (Mc Crae & John, 1992).

Chamorro-Premuzic and Furnham (2006)

Bratko
et al
(2006)

- Conscientiousness – predictor of academic achievement
 - Lead students to be organised, disciplined and motivated to succeed
- Positive effect on study, effort and commitment
- Neuroticism – cause poor exam performance due to worry and be anxious before and during exams
- Extraversion – inconsistently associated with academic achievement

O'Connor and Paunonen (2007)

Meta-analysis: relationship between the five factor model academic achievement (OCEAN)

- Conscientiousness was consistently associated with academic success
- The overall correlation across the studies was $r = 0.22$
- The highest correlation being reported by Furnham (2003) - $r = 0.40$
- Openness to experience was sometimes positively associated with scholastic achievement, the highest relationship being reported by Dollinger and Orf (1991) $r = 0.30$
- Furnham et al (2003) - a significant negative correlation between extroversion and grade point average

Personality

E and A comprise some characteristics—such as talkativeness, (E) or compliance (A)—that might bring out academic behaviour that is valued by teachers and leads to better achievement, for example, high engagement and cooperation within learning groups or high participation in class [O'Connor & Paunonen, 2007]

Students high in O might benefit because they have, on average, **higher scores on tests of intelligence**, verbal skills, and general knowledge [Ackerman & Heggestad, 1997].



Furthermore, they use more **effective in-depth learning strategies** than individuals low in O [Blickle, 1996].



C should be related to academic achievement, because students scoring high on C questionnaires are **stronger oriented toward achievement and more ambitious**, better organized, more reliable, and more self-disciplined [Steinmayr & Spinath, 2007].

Poropat [2009] - small but consistent correlations between grades and some of the Big Five.

- The strongest correlation was found for C ($r = 0.19$), followed by O ($r = 0.10$) and A ($r = 0.07$), whereas there were no correlations with N and E.

Research studies

Relationship between Extraversion and academic performance to introverts' greater ability to consolidate learning, lower distractibility, and better study habits (Entwistle & Entwistle, 1970).

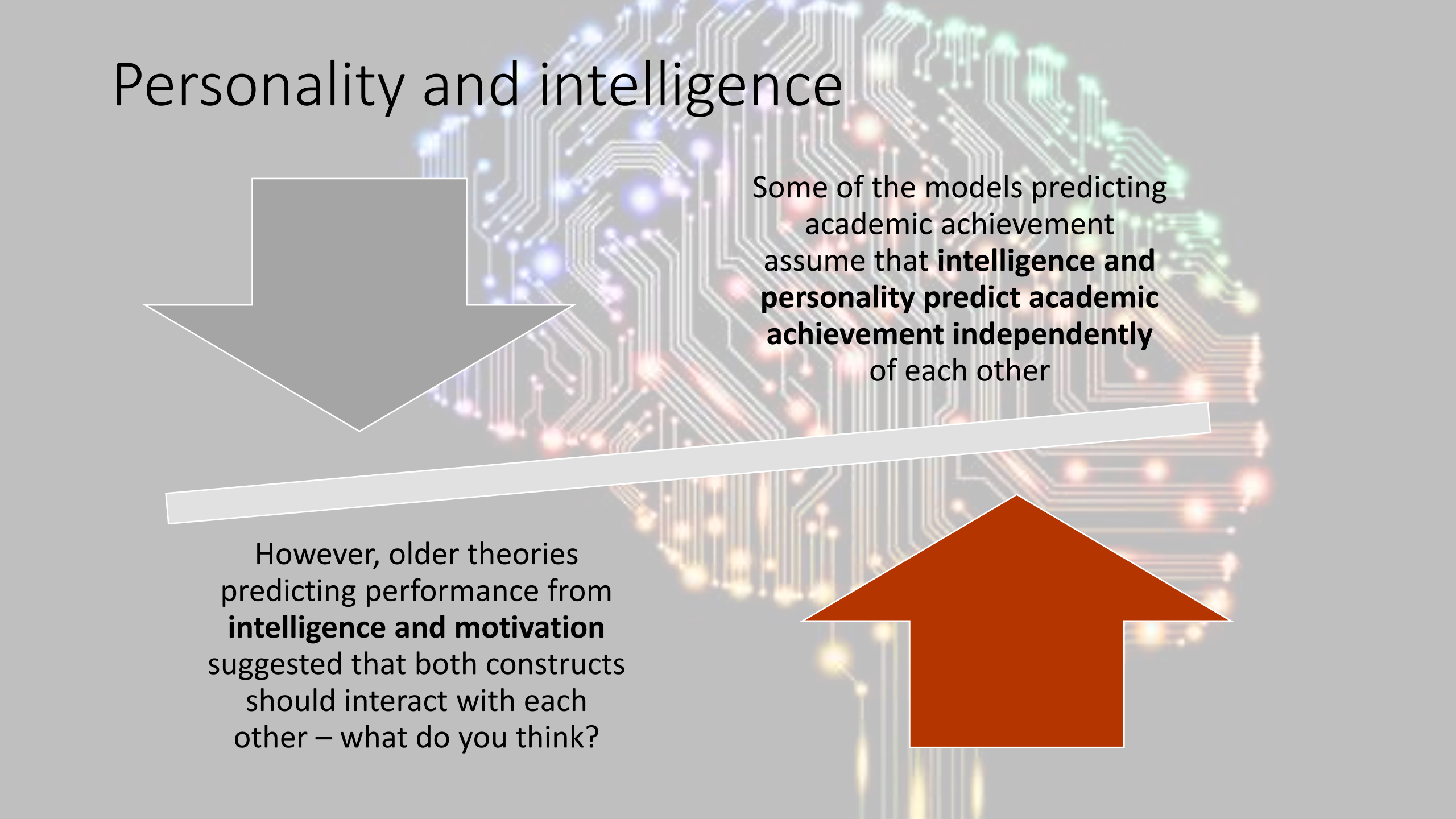
Sanchez-Marin, Rejano-Infante, & Rodriguez-Troyano (2001) - **extraverts under-perform** in academic settings because of their distractibility, sociability, and impulsiveness.

The negative relationship between academic achievement and Neuroticism (Furnham & Medhurst, 1995) has usually been explained in terms of **stress and anxiety under test conditions** (Zeidner & Matthews, 2000)

Eysenck (1996) - the **motivational effects** of anxiety may be greater in highly intelligent students because they **encounter little difficulty in their studying**.

In this sense Neuroticism is a positive predictor in bright participants but a negative predictor in less talented participants.

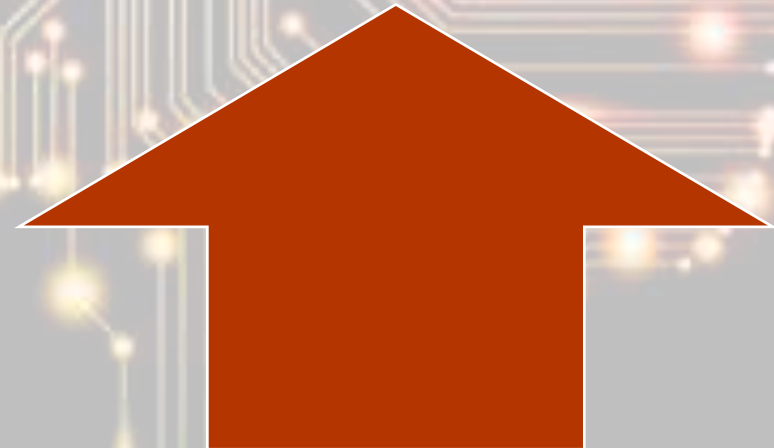
Personality and intelligence



Some of the models predicting academic achievement assume that **intelligence and personality predict academic achievement independently** of each other



However, older theories predicting performance from **intelligence and motivation** suggested that both constructs should interact with each other – what do you think?



Personality and intelligence

If **motivation is low**, intelligence should matter less for performance than when motivation is high because **smart individuals with low motivation might waste their intellectual abilities** instead of investing it in performance.

A large, dark grey arrow pointing downwards, indicating a logical flow from the first statement to the second.

On the other hand, the association between **performance and motivation should be moderated by intelligence**.

A large, dark red arrow pointing downwards, indicating a logical flow from the second statement to the third.

If **intelligence is low**, motivation should matter less for performance than when intelligence is high, because **even high motivation might be futile in the face of missing ability** [Sackett, Gruys, Ellingson, 1998].

Personality and intelligence

Whereas intelligence describes the limiting conditions academic performance depends on [Ackerman, 2011], **personality**—just like motivation—describes **how one approaches a task** [Caspi, Roberts, & Shiner, 2005].

Therefore, personality might moderate the relationship between intelligence and academic achievement (or intelligence might moderate the relation between personality and academic achievement) [Cattell, 1987].

Studies **investigating the interaction mainly focus on C** or its facet Achievement Striving, due to their close relation to achievement motivation.

Personality and intelligence

Di Domenico and Fournier [2015], and Zieal. [2009], - **C interacted with intelligence** in the prediction of GPA.

The higher C was, the higher the relation between intelligence and GPA, suggesting that **students scoring high on C questionnaires might make their cognitive ability more fruitful through hard and accurate work** than students scoring low on C questionnaires.

On the other hand, **studies predicting job performance did not find such an interaction** [Perry, Hunter, Witt, & Harris, 2010].

- Achievement Striving -more homogenous - most studies found a **significant interaction between Achievement Striving and intelligence** when predicting academic achievement [Ziegler et al., 2009; Hollenbeck et al., 1988].
- An ordinal interaction effect in high performers, a semi-ordinal interaction effect in low performers, cancelling each other out when regarding the entire sample.
- Other facets of C such as **Competence, Dutifulness, and Self-Discipline** are also **related to achievement motivation** [Bipp, Steinmayr, & Spinath, 2008] and might therefore also interact with intelligence in the prediction of academic achievement.

Red Flags of Autism Spectrum Disorder ^{6,7}

Impairment in Social Interaction

Lack of appropriate eye gaze

Lack of warm, joyful expressions

Lack of sharing interest or enjoyment

Lack of response to name

Impairment in Communication

Lack of showing gestures

Lack of coordination of nonverbal communication

Unusual prosody

Repetitive Behaviors and Restricted Interests

Repetitive movements with objects

Repetitive movements or posturing of body, arms, hands, or fingers

Learning Differences

Individual Differences

Interacting with 'personality',
'intelligence' and education

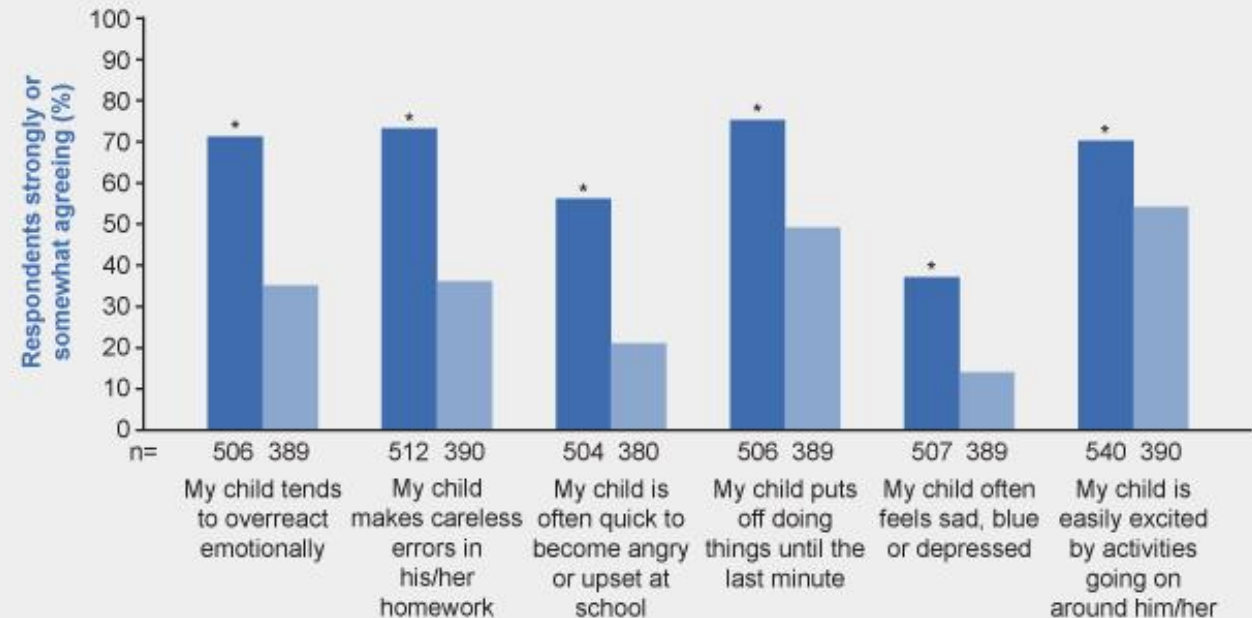
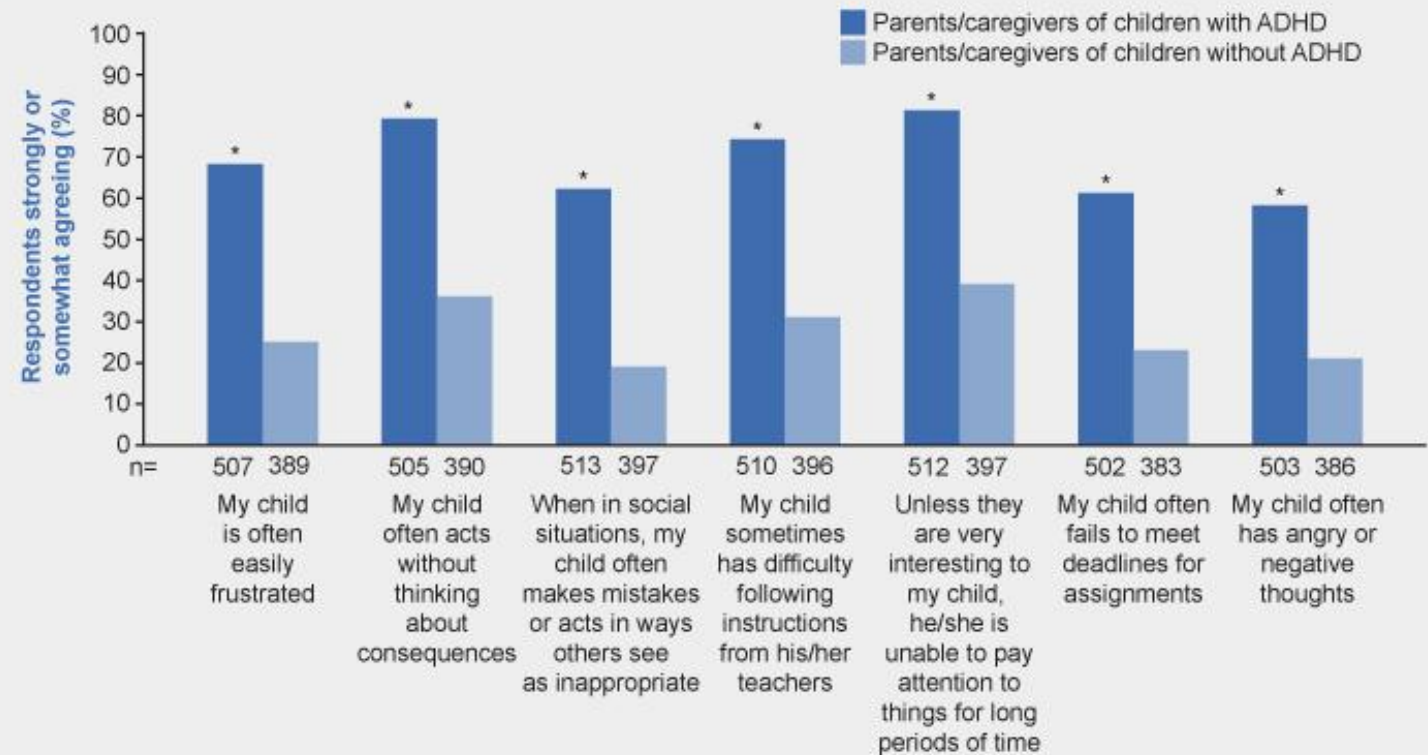
- **Autism:**
 - Low – High functioning.
 - Other factors affecting learning and performance

Learning Differences

ADHD:

- Range of intellectual abilities.
- Other factors affecting learning and performance

Dyslexia/Dyspraxia/Dyscalculia



Online seminar

- Please read this paper before the online seminar
- Psychological Assessment of Children: Guidelines and Ethics
- <https://www.researchgate.net/publication/287218175> [Psychological Assessment of Children Guidelines and Ethics](#)

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