



Mindset and perseverance of adolescents with intellectual disabilities: Associations with empowerment, mental health problems, and self-esteem



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ABSTRACT

Background: Mindset refers to the implicit assumptions about the malleability of attributes such as intelligence, behavior, and personality. Previous research has shown that people endorsing a growth mindset show better academic and mental health outcomes than those with a fixed mindset. However, little is known about the mindset of youth with intellectual disabilities (ID) and its association with mental health.

Methods: Adolescents with ($n = 247$) and without ($n = 96$) mild to borderline ID completed questionnaires about mindset and perseverance, empowerment, mental health problems, and self-esteem.

Results: Adolescents with ID endorse a more fixed mindset of emotion and behavior than adolescents without ID. No significant differences were found for mindset of intelligence and perseverance. In addition, within the group of youth with ID some differences in mindset and perseverance were found based on level of intellectual disability, gender, and comorbidities, but not for age. Finally, a growth mindset of emotion and behavior and perseverance, but not mindset of intelligence, were negatively related to mental health problems in youth with ID.

Conclusion and implications: Overall, findings indicate that teaching youth with ID a growth mindset of emotion and behavior and perseverance may be a potentially successful endeavour to improve mental health in adolescents with ID.

What this paper adds?

Previous research on mindset has mainly focused on youth without ID. The present study extends the current knowledge by investigating the mindset and perseverance of youth with ID and presents a detailed examination within this group. Moreover, this study is the first to investigate the relationship between mindset and perseverance and empowerment, mental health problems, and self-esteem among youth with ID. In addition, we provide an instrument to assess mindset and perseverance in adolescents with ID.

Abbreviations: BIF, borderline intellectual functioning; ID, intellectual disabilities; MID, mild intellectual disabilities

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1. Introduction

1.1. Physical and mental health problems among youth with intellectual disabilities

Research has shown that youth with intellectual disabilities (ID) are a highly vulnerable population as they tend to have an increased risk of comorbid physical and mental health symptoms (Cooper et al., 2015; Dekker & Koot, 2003; Munir, 2016). The prevalence studies indicate that youth with ID are three to seven times more likely to show emotional (i.e., depression and anxiety) and behavioral (i.e., attention problems and aggressive behavior) problems and lower self-esteem than their peers without ID (e.g., De Ruiter, Dekker, Verhulst, & Koot, 2007; Dykens, 2000; Einfeld, Ellis, & Emerson, 2011; Valås, 1999). In addition, youth with ID experience more difficulties and delays in academic, social and adaptive skills compared with non-ID youth. Moreover, it has been suggested that psychopathology causes greater impairment in everyday life for youth with ID than in the general population (Dekker & Koot, 2003).

Four factors have been identified that contribute to the high proportion of physical and mental health problems in youth with ID (Dykens, 2000). First, biological risk factors, such as brain damage or genetic abnormalities, are more prevalent in youth with ID and co-occur with mental illness (Crocker, Prokić, Morin, & Reyes, 2014; Goodman & Graham, 1996; State, King, & Dykens, 1997). Psychological factors, such as feelings of inferiority and incompetence due to frequently experienced failures, may also impinge on mental illness (Dykens, 2000). Third, social factors such as social rejection and/or stigmatization have been associated with mental health problems (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003; Power, 2008; Scior & Werner, 2016). Finally, familial factors, such as overprotective care, and parental coping styles and maladjustments, also relate to mental health problems (Power, 2008; Reindl, Waltz, & Schippers, 2016).

All the mentioned risk factors may have a negative impact on the mindset defined as a collection of core assumptions about the malleability of personal abilities and traits. Research has shown that mindset can be either a protective or risk factor in the psychosocial development of youth (Schleider, Abel, & Weisz, 2015). For people with ID enhancing a growth mindset may be a promising approach to improve their mental health condition. However, studies on the mindset of youth with ID and its relationship with psychosocial outcomes are scarce.

1.2. Mindset theory

The concept of mindset refers to fundamental beliefs whether or not personal attributes, such as intelligence, emotion, and personality can change (Dweck, 1999). Two types of mindset can be distinguished: a fixed mindset and, on the other side of the spectrum, a growth mindset. People with a fixed mindset view their attributes as static and uncontrollable. In contrast, people with a growth mindset believe their qualities have the potential to change through effort and experience. Consequently, the extent to which people perceive their attributes as fixed or malleable set up different psychological processes that affect how they interpret and respond, and feel in various situations. According to Dweck's theory mindset should be regarded as domain-specific. This means that people can simultaneously hold a different mindset in different domains, e.g., someone may believe that personality is malleable but intelligence is fixed (Molden & Dweck, 2006).

A wide body of research has shown that a growth mindset contributes to more beneficial academic and psychosocial outcomes than a fixed mindset (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Blackwell, Trzesniewski, & Dweck, 2007; Robins & Pals, 2002; Schleider et al., 2015), however, at present little is known about the potential outcomes of a growth mindset for youth with ID. In our study we decided to explore the associations between mindset and perseverance with empowerment, mental health and self-esteem in youth with ID.

1.3. Relationship between mindset and perseverance, empowerment, mental health problems and self-esteem

Research has shown that one's mindset is related to an array of self-regulatory processes, henceforth referred to as perseverance. These processes are related to persons attributions and reactions to effort, failure, and challenge (Burnette et al., 2013; Mrazek et al., 2018; Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018). In particular, when people believe they are capable of change, they will be more eager to learn and practice and therefore embrace challenges as opportunities to grow (Dweck, 2006). In addition, failure will be attributed to a lack of effort instead of a lack of ability. Therefore, rather than feeling helpless to change their circumstances, people with a growth mindset will exert effort to improve their abilities, reverse setbacks and prevent or overcome aversive situations (Blackwell et al., 2007). More specifically, meta-analytic results on 113 studies ($N = 28,217$, age range 5–42 years) revealed that a more growth-oriented mindset of intelligence predicted effort beliefs, learning goals, and more optimistic expectations when evaluating the potential for future success (Burnette et al., 2013).

Mindsets can also be related to empowerment which can be defined as the experienced personal competence and perceived control to handle important matters (Bandura, 1994; Damen & Veerman, 2011; Zimmerman, 1995). Perceived control is a motivational construct that has been linked to both mindset and achievement goals (Doron, Stephan, Boiché, & Le Scanff, 2009; Dweck & Leggett, 1988; Leondari & Gialamas, 2002). Two previous studies showed that stronger growth mindsets of personal traits and ability were positively related with perceived control in adolescents (Doron et al., 2009; Schleider & Weisz, 2016b).

In addition, a growth mindset seems to buffer against psychological distress and protects youth from developing mental health problems. In two undergraduate samples ($n = 388$ and $n = 210$), students (aged 19–21 years) endorsing a growth-oriented mindset of anxiety and emotion reported fewer mental health problems (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015). Similarly, a

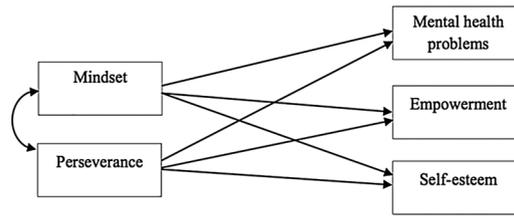


Fig. 1. Conceptual model.

meta-analysis on 17 studies revealed that children with a fixed-oriented mindset were more likely to experience internalizing and externalizing problems compared to children with a growth-oriented mindset (Schleider et al., 2015). Moreover, research has also shown that a fixed mindset predicts depression and well-being over time (Romero, Master, Paunesku, Dweck, & Gross, 2014; Tamir, John, Srivastava, & Gross, 2007). Finally, mindsets have also been related to self-esteem (De Castella et al., 2013; Robins & Pals, 2002). People with a growth mindset may be buffered against decrements in self-esteem because failure is not viewed as indicative of low ability but rather as useful feedback that inspires them to improve themselves (Robins & Pals, 2002). In particular, one longitudinal study examining 508 undergraduate students showed lower levels of self-esteem in students with a more fixed-oriented mindset and a steeper downward self-esteem trajectory compared to students with a growth-oriented mindset (Robins & Pals, 2002).

In sum, since youth with ID are more likely to struggle with mental health problems and self-esteem, these findings suggest that developing a growth mindset may serve as a protective factor which might buffer against mental health and self-esteem problems in this vulnerable population. See for a conceptual model, Fig. 1.

1.4. Mindset of youth with intellectual disabilities

Although Dweck's mindset theory has become increasingly popular, most of the research concerning mindset focuses on adolescents without ID. However, it could be argued that adolescents with ID are more likely to endorse a fixed mindset than youth without ID. First, youth with ID are likely to be aware that they are intellectually disabled, and may interpret this as synonymous with having low intellectual potential (Baird, Scott, Dearing, & Hamill, 2009). Second, the construct of self-concept has been extensively studied among persons with ID (Maïano et al., 2019 for a review). These studies have indeed shown that youth with ID are at risk to have little confidence in themselves due to the increased likelihood to experience negative life events (e.g., parental separation, financial crisis, serious illness within the family) and repeated failures (Hatton & Emerson, 2004; Koestner, Aube, Ruttner, & Breed, 1995; Maïano et al., 2019). Subsequently, this might lead to the perception that one is unable to change aversive circumstances (Dweck, 1975). Finally, research suggests that youth struggling with emotional and psychiatric problems—which are more prevalent in youth with ID—experience these troubling thoughts, feelings, and behaviors as difficult or even impossible to change (Schleider & Weisz, 2016a; Tamir et al., 2007).

The few studies available show that children and youth with ID are more prone to developing a fixed mindset than typically developing peers. Children with ID often would blame failure to a lack of effort, rather than to a lack of ability (Koestner et al., 1995). In addition, youth with ID are more likely to endorse a fixed mindset, prefer goals aimed at demonstrating and proving ability instead of increasing ability, and show less perseverance (Baird et al., 2009). Although these studies focused on the mindset of intelligence, the examination of the mindset of emotion and behavior is of particular interest for our target group, given the specific impact of mindset of emotion and behavior on psychological and social functioning (Tamir et al., 2007).

Youth with ID should be considered a heterogeneous group of individuals. Therefore, it is of particular interest to examine differences in mindset within this vulnerable population. More specifically, we argue that within this group, it is important to differentiate between (1) youth with mild intellectual disability versus borderline intellectual functioning (BIF), (2) boys versus girls, (3) youth with physical disabilities versus psychiatric problems versus multiple comorbidities, and (4) early versus mid to late adolescents.

First, people with BIF, similar to people with ID, are at greater risk of mental health problems as compared to people without ID (Peña-Salazar, Arrufat, Santos, Novell, & Valdés-Stauber, 2018; Wieland, Kapitein-de Haan, & Zitman, 2014). Little attention has been paid to the population with BIF, even though special attention to this group may be warranted, as it is unknown whether mental health care services should be specifically tailored for people with BIF (Wieland et al., 2014). Research findings regarding mindset and its correlations with age and gender among youth with and without ID are mostly inconsistent (e.g., Baird et al., 2009; Koestner et al., 1995; Schleider & Weisz, 2016b; Tamir et al., 2007), calling for a closer examination of these constructs. Finally, research has shown that treatment rates for any mental illness are lower than for physical disabilities (e.g., Buist-Bouwman et al., 2006; Ormel et al., 2008), suggesting that youth with physical disabilities, psychiatric disorders, and multiple comorbidities might experience the malleability of their emotions, behaviors, and intelligence differently compared to one another. In the present study, we will examine differences in mindset in youth with ID exploratively regarding their intelligence level, age, gender, and problem type.

1.5. The present study

The first objective was to compare the mindset and perseverance of adolescents with and without ID. We hypothesized that youth

with ID endorse a more fixed-oriented mindset of emotion and behavior and intelligence, and show less perseverance than peers without ID. The second objective was to exploratively examine differences in mindset and perseverance within the group of youth with ID, differentiating between intelligence level, age, gender, and problem type. The final objective was to examine the associations between mindset and perseverance on the one hand, and empowerment, mental health problems, and self-esteem on the other hand within the group of youth with ID. We hypothesized that stronger endorsement of a growth mindset and higher levels of perseverance were related to higher levels of empowerment and self-esteem, and to lower levels of mental health problems.

2. Material and methods

2.1. Participants

The study included youth with and without ID. Participants with ID were recruited from a Dutch residential care institution and special education schools for youth with ID and comorbid physical disabilities and/or psychiatric problems. We considered an intellectual disability as a disorder that includes significant deficits in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills, with an onset before the age of 18 (Schalock, Luckasson, & Shogren, 2007). The group of youth with ID consisted of 247 adolescents (IQ 50–85). The majority of the participants was diagnosed with comorbid problems including a physical disability, a psychiatric disorder or both. To provide insight into the types of physical disabilities we used the online International Classification of Diseases (ICD-10, World Health Organization, 1992). The most common physical disabilities included diseases of the nervous system (42.1%), congenital malformations, deformations and chromosomal abnormalities (21.4%), and neurodevelopmental disorders (12.9%). Psychiatric diagnoses included autism (58.5%), attention deficit hyperactivity disorder (ADHD; 40.4%), attachment disorder (8.5%), oppositional defiant disorder (ODD; 7.4%), anxiety disorder (7.4%), and other (e.g., dysthemic disorder, post-traumatic stress disorder, Gilles de la Tourette; 8.5%). Notably, several participants were diagnosed with one or more psychiatric disorders. In the Netherlands, individuals with borderline intellectual functioning with severe limitations in adaptive functioning are also included in the healthcare and special education system for individuals with ID. Therefore, to examine mindset differences within the ID group, we differentiated between youth with mild ID (MID: IQ 50–69) and borderline intellectual functioning (BIF: IQ 70–85).

Participants without ID were 96 students at a regular Dutch secondary education school and attending education in the four-year vocationally-oriented stream (VMBO). Table 1 shows demographic characteristics of all participants.

2.2. Procedure

Data collection took place in three phases between April 2014 and October 2017. Potential participants were initially selected by the treatment coordinator of the institute and the school psychologists. Inclusion criteria were youth between 12–23 years old with a mild to borderline intellectual disability (IQ 50–85; referral to special education or care). Besides an intellectual disability participants could have comorbid physical disabilities and/or psychiatric problems. Exclusion criteria were the presence of severe emotional problems hindering participation in the study, such as extreme aggression problems or an acute unstable mental condition. For all participants, information regarding gender, age, IQ scores, and diagnoses were provided by the coordinator or psychologists based on file information. For youth without ID, four classes of each of the four-year VMBO stream were selected to participate in this study by the school team leader.

Table 1
Demographic characteristics of youth with and without intellectual disabilities.

	ID (n = 247)		Mild ID (n = 139)		Borderline IF (n = 108)		No ID (n = 96)	
	n	%	n	%	n	%	n	%
<i>Gender</i>								
Male	157	63.6	86	61.9	71	65.7	54	56.3
Female	90	36.4	53	38.1	37	34.3	42	43.7
<i>Age groups</i>								
Early ad (< 15 yrs)	106	42.9	57	41	49	45.4	54	56.3
Mid to late ad (> 15 yrs)	141	57.1	82	59	59	54.6	42	43.7
<i>Comorbidity</i>	236	95.5	131	94.2	105	97.2	–	–
Physical	141	59.7	85	64.9	56	53.3	–	–
Psychiatric	63	26.7	24	18.3	39	37.1	–	–
Multiple	32	13.6	22	16.8	10	9.5	–	–
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>TIQ</i>	69	9.3	62	5.2	78	4.3	–	–
<i>Age</i>	15.5	1.8	15.6	15.3	15.3	1.7	14.7	1.4

Note. ID = intellectual disability; IF = intellectual functioning; ad = adolescence; yrs = years.

TIQ = total intelligence quotient. Multiple comorbidity = one or more physical disabilities and psychiatric problems.

After the selection process, detailed information about the study was sent to legal representatives of all the potential participants. Next, youth were informed by two research assistants in their classroom or group. If potential participants were absent or if they needed extra information, information was given individually at another time.

After obtaining informed consent from caregivers and youth, participants completed four questionnaires measuring mindset and perseverance, empowerment, mental health problems, and self-esteem. During the questionnaire assessment, the majority of youth with ID were guided by a trained research assistant in a quiet room. For youth without ID and a few classes of one special education school (with higher intelligence level), assessment took place in the classroom under guidance of two research assistants and the mentor teacher. Research assistants collected the data using a protocol. Participants completed the questionnaires on a computer and all participants were guaranteed anonymity.

2.3. Materials

Instruments were adjusted to reduce the complexity of the item content for participants using the Dutch guideline for developing, adjusting and conducting diagnostic instruments for people with ID (Douma, Moonen, Noordhof, & Ponsioen, 2012). As another means to reduce complexity, we unified the answering categories of the different questionnaires into one format ranging from 'completely untrue' to 'completely true', and coloured emoticons corresponding with the answering categories were added. Furthermore, we simplified or rephrased difficult words and sentences to better meet the needs of youth with ID and avoid misunderstandings due to literal interpretation. For an overview of the adapted items in Dutch, see Appendix A.

2.3.1. Mindset and Perseverance Questionnaire (MPQ)

To measure mindset and perseverance in adolescents with ID we developed the Mindset and Perseverance Questionnaire (MPQ) with Dweck's key mindset components as a theoretical starting point (Dweck, 2006). The MPQ measures adolescents' beliefs in the malleability of their emotions, behaviors and intelligence, and their perseverance in response to effort, challenges and setbacks. Information concerning the construction and factor loadings of the MPQ was presented in the Supplementary Materials. The MPQ consists of three subscales: 'mindset of emotion and behavior' (6 items), 'mindset of intelligence' (3 items), and 'perseverance' (9 items) with items scored on a five point Likert scale. All fixed mindset statements were reverse-scored such that higher scores indicate a growth mindset and higher levels of persistence. Cronbach's alphas for youth with and without ID were $\alpha = .64$ and $\alpha = .56$ for respectively mindset of emotion and behavior, $\alpha = .64$ and $\alpha = .60$ for mindset of intelligence, and $\alpha = .76$ and $\alpha = .83$ for perseverance.

2.3.2. Empowerment

Empowerment was measured with the Dutch Empowerment questionnaire youth 2.0 (EMPO Youth 2.0; Damen & Veerman, 2011). The EMPO 2.0 consists of two subscales 'intrapersonal' and 'interactional' empowerment with answering categories on a five point Likert scale. Higher score indicates stronger feelings of empowerment. In the present study only the subscale interactional empowerment (7 items) was used which is described as the alertness, willingness and resolve of an individual to change undesired situations by taking control and call upon resources (Damen et al., 2017). An example item of this subscale is 'I change things, when necessary'. Previous research indicates a satisfactory reliability for the subscale interactional empowerment (Damen & Veerman, 2011). In the present study Cronbach's alphas for youth with and without ID were respectively $\alpha = .65$ and $\alpha = .71$ if one item (i.e., 'I give up easily when things don't go my way') was deleted.

2.3.3. Mental health problems

Mental health problems were assessed using the Dutch version of the Brief Problem Monitor-Youth (BPM-Y; Achenbach, McConaughy, Ivanova, & Rescorla, 2011; Verhulst & Van der Ende, 2013). The BPM-Y contains nineteen items measuring internalizing problems (6 items, e.g., 'I feel unhappy, sad or depressed'), attention problems (6 items, e.g., 'I do not finish things that I start'), and externalizing problems (7 items, e.g., 'I threaten other people') with three answering categories with higher scores indicating a higher level of problems. Previous research showed sufficient reliability (Achenbach et al., 2011). In the present study Cronbach's alphas for youth with and without ID were respectively $\alpha = .77$ and $\alpha = .86$ for internalizing problems, $\alpha = .73$ and $\alpha = .76$ for attention problems, $\alpha = .71$ and $\alpha = .58$ for externalizing problems, and $\alpha = .84$ and $\alpha = .81$ for the total problem scale.

2.3.4. Self-esteem

Self-esteem was measured using the Dutch Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Franck, De Raedt, Barbez, & Rosseel, 2008). The RSES is a ten item Likert scale with items answered on a four point scale. An example item is 'I am satisfied with myself'. Higher score indicates a stronger sense of self-esteem. Previous research showed high internal consistency as well as high congruent validity (Franck et al., 2008). In the present study the scale showed reliability with Cronbach's alphas $\alpha = .83$ and $\alpha = .89$ for youth with and without ID, respectively.

Table 2

Means, standard deviations and group differences for mindset and perseverance, empowerment, mental health problems, and self-esteem.

Variable	MBID			Non-ID			df	t
	n = 246			n = 96				
	M	SD	Range	M	SD	Range		
<i>Mindset and perseverance</i>								
Emotion Behavior	3.67	.62	1.67–5.00	3.92	.54	1.67–5.00	341	−3.43**
Intelligence	2.99	.86	1.00–5.00	3.03	.81	1.00–5.00	341	−.38
Perseverance	3.77	.58	2.11–5.00	3.78	.57	2.11–5.00	341	−.20
<i>Empowerment</i>	3.67	.56	2.00–5.00	3.88	.49	2.33–5.00	339	−.32**
<i>Mental health problems</i>								
Internalizing	1.56	.46	1.00–3.00	1.41	.46	1.00–2.83	341	2.65**
Attention	1.75	.47	1.00–3.00	1.68	.44	1.00–2.67	341	1.32
Externalizing	1.45	.37	1.00–2.57	1.31	.28	1.00–2.00	341	3.81***
Total	1.58	.34	1.00–2.63	1.46	.28	1.00–2.21	341	3.09**
<i>Self-esteem</i>	3.01	.47	1.70–4.00	3.13	.49	1.70–4.00	340	−1.99*

Note. MBID = mild to borderline intellectual disabilities; * $p < .05$, ** $p < .01$, *** $p < .001$.

2.4. Statistical analyses¹

To examine differences in mindset and perseverance between youth with and without ID and differences within the group of youth with ID (i.e., youth with MID versus BIF, boys versus girls, youth with physical disabilities versus psychiatric problems versus multiple comorbidities, and early versus mid to late adolescents), we performed independent-samples t-tests. Moreover, Cohen's d was derived in order to measure the effect sizes of the differences between groups, with the following intervals for d : values below 0.20: no effect; 0.20 to 0.50: small effect; 0.51 to 0.80: medium effect; and 0.81 or higher: large effect (Cohen, 1988). Furthermore, to explore the bivariate associations between youths' mindset and perseverance on the one hand and empowerment, mental health problems, and self-esteem on the other hand, we calculated Pearson correlations.

3. Results

3.1. Preliminary analyses

First, the distributions of the questionnaires measuring empowerment, mental health problems, and self-esteem were examined for outliers (Tabachnik & Fidell, 2007). For youth with ID, two outliers in the self-esteem questionnaire were identified and re-scored. As suggested by Tabachnik and Fidell (2007), we assigned the outlying cases a raw score that was one unit larger (or smaller) than the next most extreme score in the distribution to reduce their impact. No outliers were identified in the questionnaires for youth without ID. In addition, indicators for normality were all in the acceptable range.

3.2. Mindset and perseverance of youth with and without intellectual disabilities

The first objective of this study was to examine differences in mindset and perseverance between youth with and without ID. All the differences between the ID and non-ID group tested in the study were presented in Table 2. There were no significant differences between youth with and without ID in mindset of intelligence and perseverance ($p > .05$), but youth with ID significantly endorsed a more fixed-oriented mindset of emotion and behavior ($d = -0.41$). Similar results were found when comparing youth without ID to either youth with MID ($t(233) = 3.77, p < .001$) or youth with BIF ($t(202) = 2.32, p = .022$). Youth without ID endorsed a more growth-oriented mindset of emotion and behavior than youth with MID ($d = -0.50$) or BIF ($d = -0.33$). Thus, youth with ID were more likely to believe that their emotions and behaviors were fixed, but did not differ in their beliefs whether intelligence was fixed or malleable nor demonstrated different levels of perseverance compared to youth without ID.

3.3. Differences in mindset and perseverance in the group of youth with intellectual disabilities

The second objective was to explore differences in mindset and perseverance in the heterogeneous population of youth with ID (see Table 3). Youth with MID endorsed a more fixed-oriented mindset of intelligence compared with youth with BIF ($d = 0.26$). There were no differences in mindset of emotion and behavior and perseverance between youth with MID and BIF. In addition, no differences were found between boys and girls regarding mindset of emotion and behavior and mindset of intelligence, although boys

¹ Individuals with autism may understand certain concepts and statements differently than those without autism suggesting caution in the use of self-report measures with youth with ASD (e.g., Mazefsky, Kao, & Oswald, 2011). However, separate analyses—once without participants with an ASD diagnoses, and once with participants with ASD treated separately—showed similar results.

Table 3
Differences in mindset and perseverance within youth with intellectual disabilities.

	Mindset EB			Mindset Intelligence			Perseverance		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
ID level									
Mild ID	3.63	0.60	-1.19	2.89	0.84	-2.06*	3.78	0.56	0.54
BIF	3.73	0.64		3.12	0.88		3.74	0.60	
Gender									
female	3.67	0.53	-0.15	2.92	0.85	-0.95	3.65	0.60	-2.34*
male	3.68	0.66		3.03	0.87		3.83	0.56	
Comorbidity									
Physical	3.73	0.58	0.91	2.99	0.82	0.52	3.78	0.48	0.55
Psychiatric	3.64	0.63		2.92	0.96		3.73	0.73	
Comorbidity									
Physical	3.73	0.58	2.48*	2.99	0.82	-0.05	3.78	0.48	0.23
Multiple	3.43	0.72		3.00	0.79		3.76	0.51	
Comorbidity									
Psychiatric	3.64	0.63	1.45	2.92	0.96	-0.39	3.73	0.73	-0.21
Multiple	3.43	0.72		3.00	0.79		3.76	0.51	
Age									
Early ad	3.67	0.65	-0.13	2.97	0.92	-0.25	3.79	0.60	0.51
Mid-late ad	3.68	0.60		3.00	0.81		3.75	0.56	

Note. EB = emotion and behavior; BIF = borderline intellectual functioning; ad = adolescence; * $p < .05$.

with ID reported higher levels of perseverance than girls with ID ($d = 0.31$).

Furthermore, no differences in mindset of emotion and behavior, mindset of intelligence, and perseverance were found between youth with ID and different types of co-occurring disabilities, with one exception. Youth with ID and multiple comorbidities (i.e., physical disabilities and psychiatric problems) endorsed a more fixed-oriented mindset of emotion and behavior compared to youth with ID and co-occurring physical disabilities ($d = 0.48$). Finally, no differences were found in mindset of emotion and behavior, mindset of intelligence, and perseverance between early and mid to late adolescents with ID. Thus, youth with MID were more likely to view their intelligence as fixed compared to youth with BIF, boys reported stronger perseverance than girls, and youth with ID and multiple comorbidities were more likely to view their emotions and behaviors as unchangeable than youth with ID and co-occurring physical disabilities.

Table 4
Correlations for mindset and perseverance, empowerment, mental health problems, and self-esteem in youth with intellectual disabilities.

Measures	Correlations								
	1	2	3	4	5	6	7	8	9
<i>Mindset and Perseverance</i>									
1. Emotion/Behavior	-								
2. Intelligence	.36	-							
	.23***								
3. Perseverance	.39	.22	-						
	.27***	.15 [†]							
<i>Empowerment</i>									
4. Empowerment	.37	-.00	.40	-					
	.24***	-.00	.28***						
<i>Mental health problems</i>									
5. Internalizing	-.33	.08	-.31	-.22	-				
	-.23***	.06	-.24***	-.16*					
6. Attention	-.20	-.10	-.49	-.20	.53	-			
	-.13*	-.07	-.36***	-.14*	.40***				
7. Externalizing	-.27	-.12	-.33	-.15	.55	.73	-		
	-.18**	-.08	-.24***	-.10	.41***	.53***			
8. Total	-.31	-.05	-.44	-.23	.94	1.00	1.00	-	
	-.23***	-.04	-.36***	-.17**	.76***	.81***	.80***		
<i>Self-esteem</i>									
9. Self-esteem	.39	-.07	.39	.49	-.76	-.33	.43	.60	-
	.28***	-.05	.31***	.36***	-.61**	-.26***	-.33**	-.50***	

Note. * $p < .05$, ** $p < .01$; *** $p < .001$. Values in italics = correlation corrected for attenuation.

3.4. Relationship between mindset and perseverance, empowerment, mental health problems and self-esteem in youth with intellectual disabilities

The third objective in this study was to investigate the relationship between mindset and perseverance, and empowerment, mental health problems, and self-esteem in youth with ID (see Table 4). Small positive correlations were found between mindset of emotion and behavior and empowerment and self-esteem, indicating that stronger endorsement of a growth mindset of emotion and behavior is related to higher levels of empowerment and self-esteem. In addition, significant negative correlations were found between mindset of emotion and behavior and mental health problems (i.e., internalizing, attention, externalizing, and total problems), indicating that higher levels of a growth mindset of emotion and behavior are related to lower levels of mental health problems. Second, mindset of intelligence was not significantly correlated with empowerment, mental health problems and self-esteem. Third, we found significant positive correlations between perseverance and empowerment and self-esteem, and significant negative correlations between perseverance and mental health problems. Thus, in youth with ID a growth mindset of emotion and behavior and perseverance are positively *associated* with empowerment and self-esteem and negatively *associated* with mental health problems, but no relationship was found between a growth mindset of intelligence and empowerment, self-esteem, and mental health problems.

3.5. Additional analyses

Additional analyses showed that youth with ID reported lower levels of empowerment ($d = 0.38$) and self-esteem ($d = -0.24$) than youth without ID, whereas youth with ID reported higher levels of internalizing ($d = 0.32$), externalizing ($d = 0.41$), and total mental health problems ($d = 0.37$). There were no significant differences between youth with and without ID regarding attention problems ($p > .05$).

4. Discussion

The results obtained in our study showed that youth with mild or borderline ID endorse a more fixed mindset of emotion and behavior than peers without ID, whereas no significant differences were found in the endorsement of a fixed mindset of intelligence and in perseverance. Although some mindset and perseverance differences were found within the ID group, results indicate that mindset and perseverance are more or less similar when taking intellectual disability, gender, comorbidities, and age differences into account. Finally, results showed that like typically developing youth, a growth mindset of emotion and behavior and higher levels of perseverance are associated with stronger feelings of empowerment and self-esteem, as well as with lower levels of internalizing, attention, externalizing, and total mental health problems (e.g., Doron et al., 2009; Robins & Pals, 2002; Schleider et al., 2015). No significant associations were found between endorsing a growth mindset of intelligence and these three psychosocial variables among youth with ID.

The fact that youth with ID seem more likely to hold a fixed mindset about their emotions and behaviors compared to peers without ID may be explained in line with presumptions of Tamir et al. (2007) and Schleider and Weisz (2016a) who suggest that individuals with more intense emotional experiences, such as youth with ID, are more likely to develop a fixed mindset, as they probably experience troubling feelings and behaviors as very difficult or even impossible to change. Previous research indicated that youth with ID experience more negative life events and experience daily stressors as more impactful compared to peers without ID (Bramston, Fogarty, & Cummins, 1999; Hatton & Emerson, 2004).

Interestingly, unlike previous research (Baird et al., 2009; Koestner et al., 1995), we did not find differences in mindset of intelligence and perseverance between youth with and without ID. Several explanations come to mind for the absence of these differences between youth with and without ID. First, youth with ID in our sample were recruited from special education schools instead of regular classrooms. This context might have decreased the risk of being exposed to overly demanding cognitive tasks (Gacek, Smoleń, & Pilecka, 2017) as well as the awareness of being identified as *intellectually* disabled which may have resulted in a higher academic self-concept among youth with ID (Szumski & Karwowski, 2015). In contrast, youth without ID in our sample attending education in the lowest ability stream (VMBO) in their secondary school may have suffered more from processes of social comparison, potentially negatively impacting their self-esteem, self-efficacy, and academic self-concept (Ireson, Hallam, & Plewis, 2001; Oakes, 1985; Szumski & Karwowski, 2015). Consequently, the perception of a limit on their intelligence might have been more evident in youth without ID compared to youth with ID in our sample, further reducing a possible difference in mindset between both groups. Moreover, differences in the measurement of a mindset of intelligence may account for the different findings in our study and previous research. For example, in the current study, three first-person fixed statements (i.e., personal intelligence as unchangeable) were used for measuring mindset of intelligence, whereas Koestner et al. (1995) interpreted the results on an eight items questionnaire assessing participants attributional style for failure as evidence for this concept.

In addition to examining differences between youth with and without ID, we also examined possible differences in mindset and perseverance in the population of youth with ID. Our findings show that youth with mild ID are more likely to hold a fixed mindset of intelligence than youth with borderline intellectual functioning. This could be explained by the fact that, in the Netherlands, youth with ID are encouraged to attend internships in regular settings and transfer to mainstream education (Leeuwen, van Thijs, & Zandbergen, 2009). However, due to their lower general intelligence, youth with mild ID may be less likely to access these regular settings and therefore, might be more likely to adopt a fixed view about the malleability of their intelligence. Notably, in line with previous studies among youth without ID (e.g., Dweck, Goetz, & Strauss, 1980), boys with ID reported higher levels of perseverance than intellectual disabled girls. This could be explained by the contrasting experiences boys and girls have with praise and feedback

(Dweck et al., 1980; Gunderson et al., 2018). For example, teachers attribute boys' failures to a lack of motivation more often than they do for girls and therefore, boys are more likely to blame their effort instead of their ability (Dweck et al., 1980). Another interesting finding was that youth with ID and multiple comorbidities were more likely to report a fixed mindset of emotion and behavior compared to youth with ID and only co-occurring physical disabilities. This could be explained by the strong relationship between psychiatric disorders and mental health problems in youth with ID (e.g., Myrbakk & von Tetzchner, 2008). As youths with more intense emotional experiences are more likely to experience difficulty in altering their troubling feelings and behaviors (Schleider & Weisz, 2016a; Tamir et al., 2007), it seems likely that youth with ID and multiple comorbidities are more likely to develop a fixed mindset of emotion and behavior.

Finally, although previous studies have demonstrated support for the hypothesis that mindset of intelligence predicts mental health outcomes among youth without ID (e.g., Doron et al., 2009; Schleider & Weisz, 2016b), the current study did not find an association between mindset of intelligence and psychosocial outcomes (i.e., empowerment, mental health problems, self-esteem) in youth with ID. This may be explained by findings of a recently published meta-analysis (Schleider et al., 2015) showing that positive associations between a fixed mindset and mental health problems are stronger— though not significant—for a fixed mindset of personality than for a fixed mindset of intelligence.

There are several limitations in this study that should be mentioned. First, given the cross-sectional design, caution is warranted for any statements about causality. Longitudinal data would allow for the test of different alternative conceptual models. For instance, it is possible that in a mediation model, mindset is the construct that sets in motion elevated levels of perseverance, which in turn affects empowerment, mental health problems, and self-esteem. Second, we assessed mindset of emotion and behavior, mindset of intelligence, and perseverance with the newly developed Mindset and Perseverance Questionnaire. Some of the subscales suffered from modest internal reliabilities and therefore, caution is needed when interpreting the results. Future research should replicate EFA using larger youth samples with ID to confirm the psychometric properties of this questionnaire. Third, it is important to recognize that findings in the present study are based on participants self-reports. Although research on mindset is dominated by self-report measures (e.g., De Castella & Byrne, 2015; Schroder et al., 2015), future research should include multiple informations and behavioral tasks. Notwithstanding these limitations, the current study adds new information to the literature in different ways. First, we expanded on previous studies by examining differences in mindset and perseverance between youth with and without ID and within youth with ID. The present study included a large sample of youth with ID. Furthermore, while existing mindset research has been domain-specific, with studies focusing either on intelligence (e.g., Blackwell et al., 2007) or on emotion (e.g., De Castella et al., 2013), we examined both mindset of emotion and behavior and mindset of intelligence in the same study. This is important because people can hold a different mindset in different domains and one's mindset in a given domain predicts different, but equally important outcomes (Molden & Dweck, 2006; Romero et al., 2014).

In conclusion, the present study demonstrates that youth with ID are more likely than their peers without ID to hold a fixed mindset of emotion and behavior. The associations between the mindset and perseverance and psychosocial outcomes (i.e., empowerment, mental health problems, and self-esteem) in youth with ID are similar to those known from previous research on peers without ID. This suggests that implementation of mindset interventions tailored for youth with ID may be a potentially successful endeavor contributing to feelings of control, self-confidence and improved mental health in youth with ID.

Declaration of Competing Interest

None.

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Informed consent

Informed consent was obtained from adolescents and parents included in the study.

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Appendix A. Original and rephrased items for the empowerment, mental health and self-esteem questionnaires

Measures	Original item (English)	Original item (Dutch version)	Rephrased item (in Dutch)
<i>EMPO 2.0</i>			
1.		Ik grijp direct in als er problemen zijn.	Ik doe meteen iets als er problemen zijn.
2.		Ik leg me niet snel bij de gang van zaken neer.	Ik geef snel op als het niet gaat zoals ik wil.
3.		Ik ben zeer goed in staat om voor mijn eigen belangen op te komen.	Ik kan goed opkomen voor mezelf.
6.		Ik vecht altijd voor zaken die ik echt belangrijk vind.	Ik zet me in voor dingen die ik echt belangrijk vind.
7.		Ik maak gebruik van raad of steun uit mijn omgeving, als dat nodig is.	Ik maak gebruik van advies, als dat nodig is.
<i>BPM-Y</i>			
4	I have trouble concentrating or paying attention.	Ik vind het moeilijk om me te concentreren of om mijn aandacht ergens bij te houden.	Ik vind het moeilijk om mijn aandacht ergens bij te houden.
17.	I threaten to hurt people.	Ik dreig mensen hen pijn te doen.	Ik dreig mensen pijn te doen.
<i>RSES</i>			
1.	On the whole, I am satisfied with myself.	Over het algemeen genomen ben ik tevreden met mezelf.	Ik ben tevreden met mezelf.
3.	I feel that I have a number of good qualities.	Ik heb het gevoel dat ik een aantal goede eigenschappen heb.	Ik heb een aantal goede eigenschappen.
5.	I feel I do not have much to be proud of.	Ik heb het gevoel dat ik niet veel heb om trots op te zijn.	Ik heb veel om trots op te zijn.
6.	I certainly feel useless at times.	Soms voel ik mij beslist nutteloos.	Soms voel ik mij echt nutteloos.
7.	I feel that I'm a person of worth, at least on an equal plane with others.	Ik heb het gevoel dat ik een persoon ben die wat waard is, op zijn minst evenveel als anderen.	Ik ben net zoveel waard als anderen.
8.	I wish I could have more respect for myself.	Ik wou dat ik wat meer respect voor mezelf kon hebben.	Ik zou meer respect voor mezelf willen hebben.
9.	All in all, I am inclined to feel that I am a failure.	Al met al voel ik me nogal een mislukkeling.	Ik voel me nogal een mislukkeling.
10.	I take a positive attitude toward myself.	Ik sta positief ten opzichte van mezelf.	Ik ben positief over mezelf.

Note. EMPO 2.0 = EMPO Youth 2.0; BPM-Y = Brief Problem Monitor-Youth; RSES = Rosenberg Self-Esteem Scale.

Appendix B. Mindset and Perseverance Questionnaire (MPQ)

- 1 I can learn to control how I feel.
- 2 I will never learn to control how I feel.
- 3 I control my behavior.
- 4 I can learn to control how I behave.
- 5 I can't really change of how I behave.
- 6 I will never learn to control how I behave.
- 7 How smart I am is sort of fixed.
- 8 I can learn something new, but how smart I am is fixed.
- 9 I can't really change how smart I am.
- 10 Practising a lot is useless.
- 11 By practising a lot I will get better.
- 12 Practising a lot means I am learning something.
- 13 If something is hard, I try even harder.
- 14 If something does not work, I quit.
- 15 If something does not work, keep practising is useless.
- 16 If something does not work, I keep going.
- 17 I prefer tasks which make me think hard.
- 18 I prefer tasks that I can learn from, even if I make a lot of mistakes.

Appendix C. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ridd.2019.103426>.

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