ACADEMIC SELF-PERCEPTION AND ITS RELATIONSHIP TO ACADEMIC PERFORMANCE

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One hundred and fifty-five students (average age, 10 years 7 months) were initially tested on reading, arithmetic, and academic self-perception. One year later they were tested again. Initial academic scores accounted for a large proportion of the variance in later academic scores. The children's self-perceptions of academic competence accounted for significant variance in academic performance one year later. However, neither the academic self-perceptions at the beginning of the study nor changes in self-perceptions over time predicted changes in academic performance. Self-perception of academic competence cannot play a simple, causal role in academic achievement.

Key words: self-perception, competence, achievement

Cent cinquante-cinq élèves (âge moyen : dix ans, sept mois) ont été examinés au niveau des compétences alphabétiques et mathématiques, ainsi que la perception de soi scolaire. Les résultats initiaux des examens scolaires expliquaient la plupart de la variance liée aux résultats des seconds examens. Les mesures de la perception de soi expliquaient aussi une part significative de cette variance. Cependant, ni la perception de soi initiale, ni les changements de perception de soi ne semblent indiquer les changements de performance scolaire. Nous constatons que la perception de soi scolaire ne peut jouer un rôle causal simple dans la performance scolaire.

Mots clés: perception de soi, compétence, performance

A major focus of cognitive educational psychology is accounting for growth or decline in academic performance. Some areas have had great success: cognitive psychology has made great strides in identifying the chief sources of variance in reading ability (Stanovich, 1998). Variation in children's abilities of phonemic awareness and phonological processing may account for as much as 50 per cent of the variance in reading ability (Stanovich, 1988). Although this research represents a tremendous accomplishment and has enormous implications for effective instruction in reading, much variance remains to be accounted for. The search for this "extraphonological" variance is occurring in many of the cognitive realms, such as temporal processing (Farmer & Klein, 1995), speed of processing (Kail & Hall, 1994), perceptual processes such as low-level visual perception (Breitmeyer, 1989), and auditory perception such as the "p-centre" (Goswami et al., 2002). Researchers have also found some variance in environmental factors, such as SES effects, number of books in the home, and parents' time spent in reading to children. However, these environmental factors do not account for a great deal of variance in reading ability and may eventually fade in significance over time (Scarborough & Dobrich, 1994a, 1994b), especially as schools adopt more effective methods of instruction.

The attempt to identify the cognitive processes involved in the acquisition of mathematics skills is much less developed. Various processes may be involved, and several have been the subject of some study. Although there has been study of higher level, domain-general processes, such as executive processes (Geary, Hoard & Hamson, 1999), semantic memory (Geary, Haamson & Hoard, 2000; Geary & Hoard, 2001), or working memory (Geary, 1993), processes specific to the domain of mathematics would seem to be more promising. Of particular interest is initial work in numerosity (Landerl, Bevan & Butterworth, 2004), the basic sense of number tapped by Piagetian conservation tasks (Gelman & Gallistel, 1978). Small units of number are normally processed without counting, a process called "subitization." Many animals, including human children, possess the capacity to subitize between three and five items (Starkey,Spelke, & Gelman, 1990; Wynn, 1992). Individuals with dyscalculia, or mathematics disability, seem to have problems at all levels of number processing, perhaps even at the level of subitization (Koontz & Berch, 1996).

There are also factors believed to account for significant growth and decline in academic performance that are external to any academic area, factors more in the realm of the psychological rather than the cognitive. Of these, one factor that has seen a significant amount of study, and a moderate degree of controversy, is self-esteem or self-concept and its relationship to academic performance. This putative relationship is at the core of the self-esteem movement and has been central to the promotion of child-centred instruction. The core of this approach is the supposition that positive self-concept or positive self-perceptions of competence are causal of many positive outcomes, including good academic performance (Valentine, Dubois, & Cooper, 2004). The implications of this belief have been enormous for modern education: Belief in the necessity of eliciting positive self-concept in students is foundational of much of modern educational theory and practice. Our intent here is not to elucidate the history of this belief because this would be a tremendously large project. However, recent reviews, such as that by Baumeister, Campbell, Krueger and Vohs (2003), have covered this history in some detail. At various levels of analysis, and in various domains, positive self-concept has been shown to be moderately correlated with positive outcomes. There is, however, very little data that would establish that this relationship is causal.

There are rational, principled reasons to suppose that positive self-concept might influence academic performance. Several mechanisms by which this relationship may occur have been proposed. The process of self-affirmation (Steele, 1988) suggests that individuals intentionally choose actions that demonstrate to themselves that their perceptions of themselves are accurate. Self-regulation (Scheier & Carver, 1988) would require individuals to monitor their ongoing behaviour to ensure that it is not discrepant from their self-concept, adjusting behaviour as necessary. Any hypothesised mechanisms could generate different predictions regarding behaviour, depending upon the level at which self-concept is assessed and the beliefs that support this assessment. For instance, assessment of self-concept at a somewhat global level, often better understood as the general self-worth or self-esteem aspect of self-concept or self-perception (Renick & Harter, 1988), seems to allow a poor self-perception of competence in the academic domain. In fact, children with learning disabilities (LD) have been shown to maintain a level of self-esteem or general self-worth comparable to normally achieving students despite lowered levels of self-perceived academic competence (Heath, 1995; Heath & Glen, 2005). Different levels of assessment, global versus domain-specific, can yield different results regarding aspects of self-concept.

This match between levels of assessment of the self and the level at which data are collected also has empirical ramifications. A recent meta-analysis by Valentine, DuBois, and Cooper (2004) looks specifically at the literature relating self-perceptions to academic outcomes. One of their findings is that studies that matched the level of self-perception assessment with particular academic domains (e.g., self-perception of competence in mathematics with an evaluation of mathematics skills) tended to find larger effect sizes than those that mismatched the level of self-assessment and the level of evaluative data. Overall, the Valentine et al. (2004) meta-analysis found only very small effects of self-perceptions upon academic achievement, on the order of $\beta = .08$.

We took some of the lessons of the Valentine et al. (2004) review and analysis to heart in the design of the current study. We used the domain specific self-perceived competence scales for reading and arithmetic from the Renick and Harter (1988) Self-Perception Profile for Learning Disabled Students (SPPLD), which is an adaptation of Harter's Self-Perception Profile for Children (Harter, 1985) and was developed to assess self-perceived competence in both normal children and children with LD. The outcome measures were closely matched to these scales; the reading and arithmetic subtests of the Wide-Range Achievement Test, Third Edition (Jastak & Wilkinson, 1993). We also looked at the relationships between self-perception of competence and change in achievement over time – this should logically be the acid test for causality.

METHOD

Population

We recruited a representative sample of children in grades four and five that would include the normal diversity found in regular classrooms. All grade-four and -five students in four, middle-class, suburban schools were invited to participate in a study of self-concept and achievement. Our sample ultimately consisted of 155 students in regular education programmes in local Montreal public schools. Students received a small gift of a pencil for returning consent forms regardless of the participation decision. Sixty-four per cent of all students returned an agreement to participate. The students ranged in age from 112 to 146 months (mean = 127.05, SD = 7.4). Ninety-two students were male, 63 were female

Measures

WISC-III Block Design & Vocabulary. We felt it was necessary to include a measure of IQ because it is a potent predictor of academic achievement and it would be necessary to control for the effects of IQ to reveal other effects. The two-subtest short form of the WISC-III (Sattler, 1992; Waters, Bruck, & Seidenberg, 1985) was used to obtain an estimate of IQ. The use of the two-subtest WISC-III short form to provide an IQ estimate for research purposes is well documented (Sattler, 1992). The Block Design and Vocabulary subtests of the WISC-III were administered to all participants. These two subtests were selected because they have excellent reliability and validity, and correlate highly with the Full Scale score over a wide age range (Sattler, 1992). For the Vocabulary and Block Design combination, the reliability estimates calculated with the Tellegen and Briggs (1967) procedure are $r = 0.91$ and $r = 0.86$ (Sattler, 1992). The scaled scores were determined for each of the subtests and then added together to determine the total scaled score. The scaled score was converted to the WISC score using a conversion table that estimates the Full Scale IQ based on the sum of the two subtest scaled scores (Sattler, 1992).

WRAT-3: The Wide Range Achievement Test. WRAT-3: The Wide Range Achievement Test (Jastak & Wilkinson, 1993) is one of the few short, quick measures of achievement in basic academic areas. It has Canadian norms and is very well represented in the research literature. From the WRAT-3 we chose two subtests, Reading and Math. Although the WRAT-3 yields both raw and standard scores, we chose to use standard scores in our analyses to assess performance and changes in performance relative to the age cohort. We also thought that standard scores were the best choice to match the demands of the SPPLD, which asks participants for their perceptions of their own competence relative to other children of the same age.

WRAT-3 Reading subtest. The reading subtest of the WRAT-3 requires the test-taker to name as many of a series of 15 letters and 42 words as possible. Words are arranged in increasing order of orthographic complexity and decreasing order of frequency. The test is halted after the test-taker makes 10 consecutive errors or exhausts the subtest items. The test yields both a raw and standard score.

WRAT-3 Mathematics subtest. The mathematics subtest requires the participant to identify numbers, count, and answer mathematics problems of varying levels of complexity. The test-taker is allowed 15 minutes to complete as many items as possible, to a maximum of 55. The test yields both raw and standard scores.

The Self-Perception Profile for Learning Disabled Students. The SPPLD (Renick & Harter, 1988) is a self-report measure for assessing domain-specific self-perceptions of both children with learning disabilities (LD) and normally achieving children in 10 areas: general intellectual ability, reading competence, spelling competence, writing competence, mathematics competence, social acceptance, athletic competence, physical appearance, behavioural conduct, and global self-worth. The SPPLD consists of 46 items with a format designed to reduce the incidence of socially desirable responses (Renick & Harter, 1988). Each question is composed of two contrasting statements (e.g. "Some kids know how to spell most words BUT other kids find it really hard to spell most words"). The child is asked to decide which statement best describes him or her and then check if that statement is "Really true for me" or "Sort of true for me." Items are scored 1-4, from low self-evaluation to high self-evaluation. The manual for the SPPLD notes that means for the subscales range from 2.51 to 3.25. The SPPLD is a close adaptation of the Self-Perception Profile for Children (SPPC) (Harter, 1985). Although the SPPLD was originally designed for use with students with LD, Renick and Harter (1988) note that the SPPLD is psychometrically sound when used with normally achieving children. They administered the SPPLD to 367 normally achieving students in grades four to eight. Internal consistency reliabilities, based on Cronbach's alpha, for each of the 10 subscales ranged from 0.79 to 0.89. Each of the 10 SPPLD subscales is distinct from the others, with limited or moderate intercorrelations. Furthermore, the factor structure for the SPPLD with normally achieving students revealed strong support for the subscale structure. Renick and Harter (1988) provide means by grade and gender for non-LD students. Similarly, Heath and Brown (1999) in their study of the relationship between self-perception of competence and depressive symptoms in normally achieving students in grades seven and eight calculated test-retest reliabilities for the domain-specific self-perceptions of competence over a five-week period and report excellent test-retest reliabilities for the academic domains (Reading 0.85; Mathematics 0.83; Spelling 0.84). The advantages of the SPPLD (even for normally achieving children) are that it provides a domain-specific self-perceived competence rating for reading and arithmetic separately rather than as the single "academic domain" as assessed on the SPPC and it is relatively concise, with a grade-three reading level, unlike other domain-specific self-perception of competence measures more commonly used in normally achieving children (e.g., Self-Description Questionnaire, SDQ; Marsh, 1988). Although no extensive studies have been done on the psychometric properties of the SPPLD, studies of the reliability and validity of the SPPC have concluded that it demonstrates extremely good psychometric properties (Byrne & Schneider, 1988; Marsh & Gouvernet, 1989). We assume that the SPPLD shares these properties.

Procedures

The arithmetic subtest of the WRAT-3 was administered in small groups of about 15 participants (i.e., all the consenting children from each class were tested together). The experimenter administered the items while two research assistants circulated to answer possible questions and deal with any problems. In a separate session the same groups performed the SPPLD. The experimenter read each item aloud while the students followed on their own forms and, again, two research assistants circulated to answer questions and deal with problems. In a break from standard procedure, four practice questions (developed by the experimenters) were read to the participants first. This change was intended to train the participants in the format of the SPPLD to ensure comprehension.

In a subsequent session, each participant was met individually to perform the Vocabulary and Block Design subtests of the WISC-III and the reading subtest of the WRAT-3. The research assistants who performed this task were trained in the administration of the WISC-III and the standardized administration procedures described in the WISC-III manual were used.

At time 2, one year later, the same procedures were used, except the WISC-III was not administered a second time.

RESULTS

Participant characteristics are noted in Table 1. The average age of the children at first testing was 127 months (SD=7.3) and the average estimated IQ score was 108.6 (SD=13.0). The average score on the WRAT-3 Reading subtest, which tested single-word reading, was 109 (SD=15.4), while the average standard score on the Mathematics subtest was 108.2 (SD=13.3).

Table 1: Participant Characteristics

Variable	Score at Time 1 (SD)	Score at Time 2 (SD)	∣Time 2 – Time 1∣ (SD)
Age	127.0 (7.3)		
WRAT-3 Reading	109.0 (15.4)[a] N=155	107.0 (13.0)[a] N=155	2.0 (10.2) N=155
WRAT-3 Math	108.2 (13.3)[b] N=155	105.4 (11.5)[b] N=153	2.9 (10.4) N=153
Reading Perceived Competence	3.5 (0.7) N=154	3.6 (0.6) N=153	0.07 (0.56) N=152
Arithmetic Perceived Competence	3.4 (0.8) N=154	3.4 (0.7) N=155	0.06 (0.67) N=154

Notes: a = $p<0.05$, b = $p<0.001$

Zero order correlations of the relevant variables are displayed in Table 2. The correlation between self-perceived competence in reading at time 1 and time 1 reading standard scores was 0.463 ($p<0.001$), and between self-perceived competence in mathematics and time 1 mathematics standard scores was 0.394 (p<0.001). Independent samples t-tests did not indicate any differences in the performances of boys and girls at time one on the Reading subtest (t_{153} = -0.619, n.s.) or the Mathematics subtest (t_{153} = -1.545, n.s.), or on self-perceived competence in reading (t_{152} = -1.419) or mathematics (t_{152} = 1.682, n.s.).

Table 2: Zero-order Correlations

Variable	1	2	3	4	5	6	7
1. T1 Reading							
2. T1 Arithmetic	0.431*						
3. T1 Rd. Comp.	0.463*	0.153					
4. T1 Ar. Comp.	0.095	0.394*	0.218*				
5. T2 Reading	0.755*	0.414*	0.527*	0.042			
6. T2 Arithmetic	0.356*	0.660*	0.096	0.442*	0.417*		
7. T2 Rd. Comp.	0.389*	0.222*	0.587*	0.107	0.473*	0.238*	
8. T2 Ar. Comp	0.118	0.385*	0.148	0.597*	0.126	0.557*	0.270*

Notes:
* = p < 0.01, 2-tailed.
Reading = WRAT-3 reading score; Arithmetic = WRAT-3 arithmetic score; Rd. Comp. = Reading perceived competence, Ar. Comp. = Arithmetic perceived competence

The correlation between self-perceived competence at time 1 and at time 2 was 0.597 (p<0.001) for mathematics and 0.587 (p<0.001) for reading. The difference between self-perceived competence scores at time 1 and time 2, and the difference between achievement scores at time 1 and time 2 (in each case, time 2 score – time 1 score) was calculated for each subject, as were the absolute differences (time 2 score – time 1 score). The median, absolute change in self-perceived competence scores was 0.25 for reading and 0.50 for mathematics. The first quartile of the absolute change scores, in each case, was 0.00. Thus, a quarter of the participants made no change, either growth or decline, in self-perceived competence over the year, and another quarter changed only slightly. The mean change in self-perceived reading competence was -0.07 (SD = 0.6), and in mathematics, -0.06 (SD = 0.7). Paired-sample t-tests indicated that self-perceived competence scores at time 1 and time 2 were not significantly different for reading ($t_{151} = -1.524$, n.s.) or mathematics ($t_{153} = -1.018$, n.s.). Self-perceptions of competence were generally high in both domains, with the modal score at both times being 4.0, the highest possible.

Academic performance was also fairly stable across the period of the study, with the correlations between reading achievement at time 1 and time 2 being 0.755 ($p<.001$) and between mathematics achievement at time 1 and time 2 being 0.660 ($p<.001$). Achievement test standard scores were more likely to change between time 1 and time 2 than self-perceived competence scores. The median, absolute change in reading achievement was 6 standard score points, in mathematics, 8 standard score points. The mean change in reading achievement between time 1 and time 2 was 2.0 (SD = 10.2), in mathematics achievement, 2.9 (SD = 10.4). Paired-sample t-tests indicated statistically significant differences between time 1 and time 2 reading scores ($t_{154} = 2.473$, $p<.05$) and mathematics scores ($t_{152} = 3.466$, $p<.001$). Shapiro-Wilk goodness of fit tests indicated that the distributions of the change scores for reading and mathematics did not significantly differ from normality (for reading, W = 0.983, n.s.; for mathematics, W = 0.976, n.s.). The reliability of the change scores was assessed by the computation of an error/tolerance ratio (Miller & Kane, 2001). The standard error was used as an estimate for the error term (0.827 for the reading change score, 0.837 for the mathematics change scores); the standard deviation was used as an estimate for the tolerance term (10.224 for the reading change score, 10.357 for the mathematics change score). The resulting ratios are 0.827/10.224=0.081 and 0.837/10.357=0.081.

Gender differences have been reported in the literature in this area (Harter, 1985). We used independent samples t-tests to compare the self-perceived competence scores at time 1 for males and females, but found no significant differences in either self-perceived competence for reading (t_{152} = -2.182, n.s.) or self-perceived competence for mathematics (t_{152} = 1.762, n.s.).

The correlation between self-perceived competence at time 1 and achievement at time 2 was 0.527 ($p<.001$) for reading and 0.442 ($p<.001$) for mathematics. After partialling out the effects of time 1 achievement, the correlations were 0.306 ($p<.01$) for reading and 0.251 ($p<.001$) for mathematics. Self-perceived competence at time 1, however, was not predictive of change in academic performance across time (see Table 3, for reading, r=0.029, n.s.; for mathematics, r=0.024, n.s.). Neither was change in self-perceived competence related to change in performance between time 1 and time 2 (for reading, r=0.084, n.s.; for mathematics, r=0.142, n.s.).

Table 3: Correlations with Change Scores

Variable	1	2	3	4	5
1. T1 Rd. Comp.					
2. T1 Ar. Comp.	0.218*				
3. Δ Rd. Comp.	0.597*	0.150			
4. Δ Ar. Comp.	0.107	0.576*	0.245*		
5. Δ Reading	0.029	0.090	0.084	0.086	
6. Δ Arithmetic	0.095	0.024	0.061	0.142	0.151

Notes:
* = p < 0.01, 2-tailed.
Rd. Comp. = WRAT-3 reading perceived competence, Ar. Comp. = WRAT-3 arithmetic perceived competence, Δ Rd. Comp. = Change in reading perceived competence from time 1 to time 2; Δ Ar. Comp. = Change in arithmetic perceived competence from time 1 to time 2; ΔReading = change in WRAT-3 reading score from time 1 to time 2; Δ Arithmetic = change in WRAT-3 arithmetic score from time 1 to time 2.

DISCUSSION

For the participants in this study, self-perception of competence in reading and mathematics was a somewhat accurate and moderately stable attribute, which was moderately predictive of future performance, accounting for roughly 16 per cent to 25 per cent of the variance in later achievement. However, after accounting for the effect of initial levels of achievement on later achievement, the predictive ability of self-perceived competence becomes more modest, accounting for between six per cent to nine per cent of variance in academic performance one year later. More interesting is the finding that self-perceived competence ratings did not predict change in achievement between time 1 and time 2. Although change scores have been viewed with great suspicion, it has been shown (Miller & Kane, 2001; Yin & Brennan, 2002) that change scores can be used as reliable and valid indicators of variation in performance over time. The finding of a favourable error/tolerance ratio (E/T), which compares the probability of error in the score to the tolerance for error in the score, gives reassurance in our use of the change scores in this particular case. If self-perception of competence were causal to academic performance, not merely related, one would expect that perception of competence at time 1 would predict not just later achievement, but also the change in achievement over time, that is, the performance of those participants who rated themselves as very competent would be more likely to improve over time, while the performance of those who rated themselves as less competent would be likely to decline over time. This relationship was not evident. Another possibility is that change in participants' judgment of their competence over time would be related to change in performance over time, that is, for participants whose self-perceptions of competence improved, one would expect performance to improve over time, and vice versa. Again, this relationship was not evident. Thus, the data in our study did not support the hypothesis that self-perception of academic competence in particular domains is a causal factor in academic performance.

Although this study is not the first to investigate the causal role of self-perceived competence for various outcomes, it is one of the first to look at self-perception in particular academic domains and to relate this score to outcomes in those particular domains. This procedure is a very specific test of the self-concept hypothesis, where one would predict very specific outcomes. Previous studies, such as those of Skaalvik and Hagtvet (1990), have investigated the relationships between general academic self-perception and general academic outcomes. In their study of a large number of students using a structural equation modeling paradigm, these researchers found no causal role for self-perception in academic outcomes. Our study supports and expands upon this finding in specific academic domains.

Implications

What are the implications of this study for educators? In combination with other findings, which also dispute any causal role for self-perception in academic (and many other) outcomes, it is clear that the modulation of self-perception, to affect academic outcomes, is not an enterprise that should absorb much of any school's limited resources of time and money. This is not to say that self-perception is irrelevant and should be ignored. Self-perception may play a role in protecting emotional well-being. Heath and Glen (2005) proposed a "self-protection" hypothesis, whereby individuals may hold positively distorted self-perceptions of competence to shield themselves from the emotional consequences of failure. In this case, a mismatch between self-perceived and demonstrated academic competence could be a signal to teachers and others of a need to intervene, a sign of distress. Trying to bring student's self-perception back in-line with their actual performance with academic feedback does not seem to be effective in changing the perception and could even be harmful (Glen, Heath, Karagiannakis, & Hoida, 2004). On the other hand, with our data, we strongly argue against reliance on interventions intended to boost self-concept to improve academic performance. A combination of emotional support and effective instructional activities would seem appropriate. Research with students with LD indicates that their self-perception of academic competence may be less related to actual competence than it is to mood (Heath & Brown, 1999). Like their peers without LD, self-perceived competence of students with LD is inflated – lower than that of students without LD but still inflated. The results of this study may be seen as a possible first indication that the self-perceived competence of children without LD, like children with LD, may be more affectively than academically driven.

This study should not be interpreted as showing that self-perception, in this case self-perceived competence in particular academic areas, is unimportant. Rather, this study, among others, indicates that the interaction of self-perception of academic competence and actual academic performance is not direct or simple (Hoza et al., 2004; Heath & Glen, 2005). Future research should work toward capturing the more complex aspects of these relationships.

Limitations

One limitation of this study is the high, stable scores on the self-perception measure. The ceiling effect that results from the modal score of 4.0 (the highest possible) damps down variability. It does not eliminate it, however, and 50 per cent of the participants had scores below 4.0. Students who score high on self-perceived competence at time 1 should be among those who improve in performance over time, and vice versa, if self-perceived competence has a causal role. The lack of change in self-perception over time speaks against this causal role because there was significant change in performance. If self-perceived competence were either the cause or the result of changes in performance, it should track change in performance. The lack of change in self-perception despite change in performance strongly implies independence between the two factors.

Another limitation of this study is that measurements were made only one year apart. It is possible, of course, that had the study looked at a longer time span the results might have been different, although no research or theory predicts what time span might be required for a self-perception effect to mature. Likewise, a different participant age-group might have shown different results. Perhaps adolescents would be more likely to show the effect of interest. Future research might productively look into other domains, with different instruments having similar domain-specificity, different participant populations and longer durations. Family variables may also be important, for instance family background variables (Bachman & O'Malley, 1986). Clearly, no one study can address all these variables and much more research is necessary.

One of the unique aspects of this study centres on one of the points on which we differ from the recommendations of the Valentine et al. (2004) meta-analysis. This is in the procedure of partialling out variance in time 1 achievement from time 2 achievement scores. Instead, we correlated our self-perception measures directly with the difference in achievement scores between time 1 and time 2. We believe that this test of the hypothesis is more direct than one can infer causality if one can explain change in scores over time, not merely end states. The practice of statistically removing variance attributable to time 1 achievement is not conceptually the same. This process will control for the influence of prior learning on later learning. However, this is a rather artificial concept – later learning depends completely upon earlier learning having taken place. The use of a change score does not eliminate the influence of prior learning, and does directly represent what must be explained – the changes in achievement which may, or may not, be due to self-perception.

Had we used the procedure recommended by Valentine et al. (2004), we would have reported results much more similar to those arrived at in their review and meta-analysis – partialling out the variance in time 2 achievement due to time 1 achievement yielded a correlation with domain-matched self-perception of roughly $r = 0.300$. Using this process, we would appear to explain, then, about 9 per cent of the variance in achievement. However, the process we used, correlating change in achievement scores over the year with domain-matched self-perception, yielded correlations of essentially zero. This procedure would indicate that self-perception accounts for no variance in the growth or decline in achievement, an effect size of zero. Thus this study replicates the findings of the Valentine et al. (2004) meta-analysis on one level, but also gives new food for thought in the ongoing debate about self-concept and achievement.

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