

## THE ACADEMIC CONSEQUENCES OF PROBLEM BEHAVIOURS IN MIDDLE CHILDHOOD AND LINKAGES BETWEEN EXTERNALISING AND INTERNALISING DIFFICULTIES

Kimberley Kong

*Children's Research Centre  
Trinity College Dublin*

Corresponding author: kongk@tcd.ie

### ABSTRACT

*Numerous studies have documented relationships between problem behaviours and academic achievement measures. This study was initiated to address the relationship between parent-reported problem behaviour symptoms (externalising and internalising) and standardised measures of academic achievement. The sample comprised of 3678 boys and 3846 girls in Ireland who were tracked over two time points. The first wave of data was collected when the children were 9 years old, followed by a second wave when they turned 13 years. An autoregressive model linking data at age 9 and age 13 was used to test the linkages between problems behaviours (externalising and internalising) and academic achievement over time, while simultaneously controlling for within-time association. Secondly, the study also seeks to clarify the association between symptoms of externalising and internalising within the broader domain of problem behaviours itself. Results suggested that problems behaviours evident in middle childhood appeared to undermine academic competence by early adolescence. Likewise, early academic failures were associated with later problem behaviours. On the other hand, externalising and internalising difficulties showed reciprocal relationships over time. Implications of cascade effects for research and intervention are discussed.*

**Keywords:** *academic achievement, problem behaviours, internalising, externalising, cascade*

### INTRODUCTION

Much research in the past has established an association between problem behaviours and academic achievement among school children (Ansary & Luthar, 2009; Chen, Rubin, & Li, 1997; Hawkins et al., 2003; Schwartz et al., 2006; Stipek & Miles, 2008). From an educational perspective this knowledge is significantly relevant as problem behaviours impede academic functioning. From a psychopathology perspective, academic failures pose a significant risk factor for poor behavioural outcomes. Literature review also posits that behavioural and academic problems exert reciprocal influences on one another, which, over time, can negatively affect the development of individuals and their environments. Regardless of perspective, a clear understanding of the relationship between problem behaviours and academic achievement

will help generate appropriate assessment, prevention, and intervention strategies for at-risk school children.

While it is firmly established that problem behaviours are negatively associated with children's academic achievement concurrently, less is known about their associations over time. In this study, problem behaviours are further differentiated by symptoms of externalising and symptoms of internalising. Research in the past has implicated that problem behaviour in one domain (e.g., externalising problems) will undermine functioning in another domain (e.g., academic achievement) as well as exacerbating the risk of other problem behaviour (e.g., internalising problems) (Chen et al., 1997; Masten et al., 2005; Maughan et al., 2003; Patterson & Capaldi, 1990).

In order to test these relationships, it is therefore necessary to have more than two domains of development measured at two or more time points. Using two waves of longitudinal data, the current study has been set up to measure three major childhood developmental task domains that include academic achievement, externalising and internalising difficulties at age 9 and 13 respectively. The purpose of this study is two-prong. Firstly, it seeks to establish the longitudinal association between children's problem behaviours and academic achievement. Secondly, it aims to increase understanding on how functioning in one domain spreads over to another domain over time in what is commonly referred to as '*cascade effects*' (Sameroff, 2000).

### **Problem behaviours and academic achievement**

A range of problem behaviours has been linked to academic achievement. In terms of externalising symptoms, broadly defined early antisocial behaviours such as aggression and hostility have been repeatedly implicated in the establishment of later, poor academic functioning and achievement (Ansary & Luthar, 2009). Children presented with initial externalising symptoms such as inattention and impulsivity generally tend to do less well academically when compared to their better adjusted peers (Chen, Rubin, & Li, 1997).

Disruptive behaviours alienate parents, teachers and healthy peers while encourage acceptance by more deviant peers, eventually leading to disinterest in school and indirectly reducing academic achievement (Schwartz et al., 2006). At extreme levels, aggression could also result in a child being expelled from school (Risi, Gerhardstein, & Kistner, 2003), which further removes the pupil from an environment that promotes academic functioning. In other cases, the pathways by which externalising behaviour erodes academic competence may be less direct. For instance, a child with conduct problems may be removed from a normal classroom and be placed in a special classroom for behaviourally challenging children. The isolation and social stigma associated with the placement itself might bring on unintended academic consequences. Research evidence also suggests that antisocial behaviours and academic skills are linked even before a disorder can be diagnosed and before children

enter school (Hinshaw & Anderson, 1996). What is certain is that antisocial behaviour appears to undermine academic achievement throughout the school years (Risi et al., 2003). Notwithstanding, a study conducted by Duncan (2007) involving six large international data sets indicate that high levels of children's externalising behaviour problems around the time of kindergarten entry were weakly associated with low levels of academic achievement. While some inconsistencies do exist in the literature, most findings are in support of the notion that children's early behavioural problems impact their subsequent academic achievement.

In terms of internalising difficulties, it has been suggested that problem behaviours in this domain may undermine academic achievement by eroding cognitive functioning (Maughan et al., 2003), or by interfering with attentional focus and participation during classroom learning activities (Roeser, van derWolf, & Strobel, 2001). Internalising symptoms, such as being withdrawn or passive, may also discourage the use of adaptive learning strategies, resulting in poorer academic self-efficacy and performance (Roeser, Eccles & Sameroff, 2000).

On the other hand, studies have indicated that academic achievement during adolescence is associated with desistance from antisocial behaviour (Thornberry, et al., 2003). A comprehensive study among American farming families concluded that academic success holds the potential to "minimizing problem behaviour of all kinds" (p. 215), particularly antisocial and risk-taking behaviour (Elder & Conger, 2000). Achievement gains also predict improvements in depressive symptoms, though this evidence is relatively sparse and somewhat less consistent than the evidence linking conduct and academic achievement over time (Maughan et al., 2003). Preventive interventions that boost competence at school have shown corresponding reductions in the risk for developing problem behaviours (Hawkins et al., 1999). However, it is not clear whether such interventions work by reducing the corrosive effects of externalising behaviour on classroom success or by improving academic skills.

Looking from the perspective of incompetence, academic failures could potentially instigate the development of problem behaviours, or exacerbating current symptoms of problem behaviour (Maughan et al., 2003). The practice of tracking children into lower-achieving classrooms due to academic performance or retaining them in grade may increase the risk for subsequent internalising or externalising problems (Pagani et al., 2001). Placement in special education class might alter the nature of opportunities, resulting in stigmatisation, or increases affiliation with deviant associates. Increases in problem behaviours could result from the effects of concentrating deviant children together in a classroom, who may reinforce each other's negative behaviours (Dishion & Poulin, 1999), or by lowering expectations for academic performance of children, teachers, and parents, or injuring self-esteem (Roeser, Eccles & Sameroff, 2000). Poor academic functioning has been found to decrease positive self-representations, as well as increases in self-deprecation and decreases in perceived control, all of which would be posited to lead to increases in internalising problems (Herman et al., 2008). Academic failure in school might also reduce children's positive social status in some cases, which might also lead to negative self-perceptions and subsequent socioemotional problems (Chen, Rubin, & Li, 1997). Nonetheless despite strong theoretical premises, validation for academic incompetence leading to later internalising difficulties is mixed.

#### **Externalising and internalising behaviours**

Besides erosion of academic achievement, externalising problem behaviours have also been linked, albeit less consistently, to internalising symptoms. Difficulties associated with externalising problems (e.g., conduct problems, attentional difficulties) may likely strain family or peer relationships, both of which may contribute directly to heightened anxiety and lower self worth (Burks, Dodge, & Price, 1995), and leave children more vulnerable to depression (Reinherz et al., 1993). Initial internalising problems also have been identified to increase externalising problems through one of the following processes. First,

children may "mask" depression by acting out and engaging in antisocial activities (Carlson & Cantwell, 1980). Second, due to peer relation difficulties and isolation, children with initial internalising problems may gravitate towards forging relationships with deviant peers, who would then model and reinforce them for engaging in less desirable activities (Oland & Shaw, 2005). Other studies have found internalising symptoms to reduce the risk of antisocial behaviour, acting as a kind of braking system for the development of rule-breaking conduct problems and associated risky behaviours (Moffitt et al., 2002). This effect might be related to the role of inhibition in development or a protective effect of self isolating behaviour when peers are deviant.

## **METHODS**

### **Participants**

This study uses secondary data from a larger study called Growing Up in Ireland Longitudinal (GUI) Study. Over 8,000 children and their families were recruited from 625 primary schools throughout Ireland. The first data collection took place in 2008 when the children were 9 years old, and mostly attending third year of Irish primary school. The cohort was followed up 4 years later when the children were 13 years old. The retention rate was 88%. Only samples that were present in both time points were included, leaving the final number of participants in the current study at 7524 children (3678 boys and 3846 girls). A comprehensive battery of multi-method, multi-informant data were collected on the cohort at the outset of this longitudinal project, with unusually thorough data on academic measures, symptoms of psychopathology and many other attributes of child and family.

### **Measures**

Academic competence is measured using the standardised Drumcondra Math Test (25 items) and Numerical Ability Test (20 items) developed by the Educational Research Centre (2016) in Ireland. The scores from each of these tests were standardised into z-scores with a mean of 0 and standard deviation of 1.

**Table 1.** Details of measures and instruments used

Construct	Instrument	Focus of measure
Externalising at T1 & T2 (composite)	SDQ Conduct Problem (5 items)	obedience, compliance with request from adult, temper tantrums and anti-social behaviour
	SDQ Hyperactivity (5 items)	Restlessness, distraction, attentional skills, impulsiveness,
Internalising at T1 & T2 (composite)	SDQ Peer Problem (5 items)	Making friends, getting along with others, likeability
	SDQ Emotional Problems (5 items)	Fear, apprehensiveness, anxiety, worry, somatic complaints
Academic at T1	Standardised Drumcondra Math Tests (25 items)	problem- solving, reasoning, understanding and recalling
Academic at T2	Standardised Drumcondra Numerical Ability Tests (20 items)	reasoning with numbers, manipulation of numerical relationships

The construct of externalising behavior problems is conceptualised as a grouping of behavior problems that are manifested in children's outward behavior and reflect the child negatively acting on the external environment (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 2001). These externalising disorders consist of disruptive, hyperactive, and aggressive behaviors (Hinshaw, 1987). Other terms used to describe externalising behavior problems include "conduct problems," "antisocial," and "undercontrolled" (Hinshaw, 1987). In the current study, externalising behaviour is operationalised as conduct problems and hyperactivity.

The construct of internalising behavior problems is conceptualised as problems that centrally affect the child's internal psychological environment more than the external world. These behaviours include withdrawn, anxious, inhibited, and depressed behaviours. Other terms for this cluster of behavior problems include "neurotic" and "overcontrolled" (Campbell et al., 2000; Eisenberg et al., 2001; Hinshaw, 1987). In the current study, internalising behaviour is operationalised as emotional difficulties and peer problems.

Externalising and internalising problems at both time points (age 9 and age 13) were assessed using parent reports of Strength and Difficulty Questionnaire (SDQ). Construct for externalising problems (ext9, ext13) comprises of a composite score of both Conduct Problems (5 items,  $\alpha=0.82$ ) and Hyperactivity subscale (5

items,  $\alpha=0.66$ ). Each item is scored on a 3-point (5 items) from 'Not true' (0), 'somewhat true' (1) to 'Certainly true' (2). Total of five items from each subscale is summed to form a grand score; combined grand scores of both Conduct Problems and Hyperactive form a composite with higher scores indicative of more externalising problems. Similarly, internalising problems is operationalised using a composite of emotional (5 items,  $\alpha=0.70$ ) and peer problem subscales (5 items,  $\alpha=0.85$ ). A higher composite score of internalising problems are indicative of more emotional and peer difficulties.

In addition to measures of developmental tasks, three other measures were included in the model as controls. This trio represents a strong set of psychosocial risk indicators implicated for academic problems and problem behaviours (Bradley & Corwin, 2002) and therefore must be controlled when models about cascades and progression are tested. These controls are listed as follows

a) socio-economic disadvantage – a composite index based on a tally of five socioeconomic indicators namely low maternal education, unskilled occupation, bottom quartile family income, welfare dependence, and receipt of free medical assistance

b) global adversity - a composite of 12 potentially disturbing and/or traumatic life events adapted from National Longitudinal Survey of Children and Youth (NLSCY) which includes death of parent, divorce/separation of parent, incarceration, chronic illnesses,

substance abuse and mental health issues in family

c) Parenting quality – parent report on level of closeness between parent and child as measured by Pianta Parent-Child Relationship Subscale consisting of 10 items ( $\alpha=0.75$ )

### **Theoretical Framework**

The theoretical underpinning for the current study is the dynamic systems theory. According to this theory, changes in one area of functioning can trigger a sequence of consequences that ultimately have large developmental effects (Sameroff, 2000; Thelen, 1989). Thelen (1989) describes such developmental cascades as “Changes in any one domain therefore may become amplified and have system-wide reverberations” (p. 94). Implicit in all theories of development that focus on the transactions among individuals and other systems is the possibility of spreading effects that result from dynamic interactions over time. Interventions to prevent or contain such progressions of behaviour along maladaptive pathways in development necessitate better understanding of positive and negative cascades in development.

### **Analysis Plan**

This study hopes to address the following research questions

1. What are the consequential effects of early externalising and internalising problem behaviours on later academic achievement?
2. What are the early academic effects on later development of externalising and internalising problem behaviours?
3. Are there reciprocal effects between externalising and internalising problem behaviours over time?

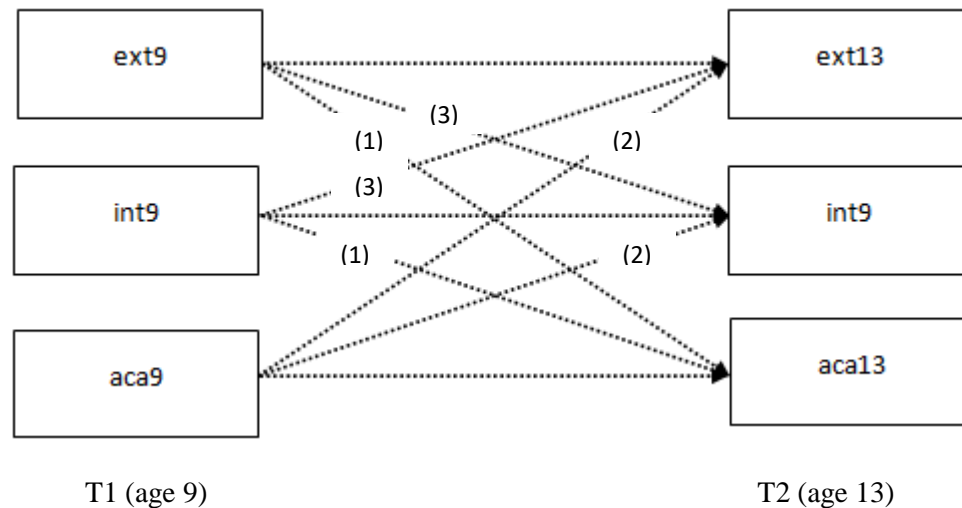
An autoregressive model is used to test out the linkages between the two domains of problem behaviours and academic achievement.

Autoregressive models are based on the idea that previous behaviour is the best predictor of present behaviour (Geiser, 2012). For this reason, measurement data at age 9 (termed as T1) were connected to age 13 (termed as T2) through so-called autoregressions in the model. These three developmental task domains were tested simultaneously in order to examine the cascade effects that spill over from one domain to the other in an interval of 4 years spanning from middle childhood to early adolescence. Cascade effects refer to the processes by which function in one domain influences another domain by way of spreading the effects over time to shape the course of development (Burt et al., 2008). Both within-time and across-time association were accounted for in the model. The relationship between achievement and problem behaviours were examined against the hypotheses constructed from a set of theoretical perspectives.

The first hypothesis reflects a notion of adjustment erosion which suggests that initial externalising or internalising symptoms reduce later academic achievement. From this perspective problem behaviours commonly associated with externalising and internalising difficulties were expected to negatively impact academic achievement across the two time-points. This first set of cross-domain linkages include three paths marked as ext9 to aca13 and int9 to aca13.

The second hypothesis features an academic incompetence perspective which posits that initial failures in academic functioning instigate the development of externalising or internalising symptoms, or exacerbate current symptoms of problem behaviour. This second set of linkages includes two paths: aca9 to int13 and aca9 to ext13.

The third hypothesis asserts that there are reciprocal effects between symptoms of externalising and internalising over time: ext9 to int13 and int9 to ext13.



**Figure 1.** Conceptual presentation of hypothesised cross-domain model

Within-time associations among constructs are included but not shown. Numbers in parentheses denote the different hypotheses tested in the model. ext = externalising problems; int = internalising problems; aca = academic achievement.

Finally, significant cross-domain cascade effects were specifically put to the further test by including controls for parenting, socioeconomic risk and global adversity pertinent to those cascades.

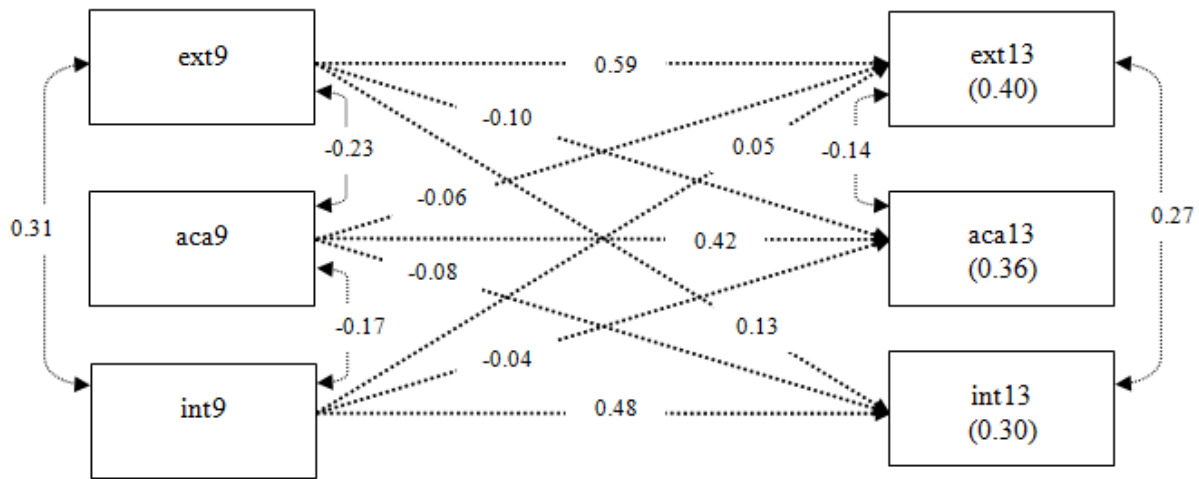
All the analyses of models were conducted in Mplus 7.0 using full information maximum likelihood estimation (Muthén & Muthén, 2007). Full information maximum likelihood based parameter estimates provide less biased information than ad hoc procedures such as listwise deletion, pairwise deletion, or imputation (Schafer, 1997).

Prior to analyses, variables of interest were screened for pattern of missing data, outliers and for normal and bivariate assumptions of distribution. As the samples of the study were recruited through schools, a two-level approach

is undertaken in order to isolate the clustering effects due to the nestedness of the data within the schools (level-2).

## RESULTS

Figure 2 shows the model fitting results for the cross-domain analyses. All three domains of academic, externalising and internalising were found to be significant and positively stable across time ( $p < 0.005$ ). On average, the stabilities for externalising problems were the highest ( $\beta = 0.59$ ), followed by those for internalising problems ( $\beta = 0.48$ ), and lastly academic achievement ( $\beta = -0.42$ ). The standardised estimates are consistent with past studies both in magnitude and in direction (Bornstein, 2013; Molainen, 2010).



**Figure 2.** Cascade (cross domain) model with standardised estimates

Note:  $R^2$  values are in parentheses. Numbers denote time points of data collection. All displayed paths are significant at  $p < .001$ .

For space saving reason, paths that are insignificant ( $p > 0.001$ ) have been omitted; ext = externalising problems; int = internalising problems; aca = academic achievement.  $N = 7524$ ,  $CFI = 0.99$ ,  $TLI = 0.90$ ,  $RMSEA = 0.07$ ,  $SRMR = 0.00$

There was evidence of initial externalising or internalising problem behaviours reducing later academic achievement. High levels of externalising problems at age 9 were associated with low levels of academic achievement at age 13 ( $\beta = -0.10$ ,  $p < 0.005$ ). Likewise, high levels of internalising problems were linked with low levels of academic achievement ( $\beta = -0.04$ ,  $p < 0.005$ ). For both of associations, prior levels of achievement were controlled in the model. Negative within-time association between externalising symptoms and academic achievement was also observed at T1 and T2 respectively.

As for achievement and internalising, within-time association between these two domains at T1 was also significant though not as strong as the covariation between externalising symptoms and academic achievement. However, at T2, the within-time association disappeared altogether suggesting that the relationship between the two domains may be modified longitudinally once controls for their stability and prior covariation have been applied. What this might imply is that children are able to adjust themselves academically when they are older, in spite of their peer difficulties and emotional problems.

In terms of academic effects, high levels of academic achievement at age 9 associated with low levels of externalising ( $\beta = -0.08$ ,  $p < 0.005$ )

and internalising behaviours ( $\beta = -0.06$ ,  $p < 0.005$ ) at age 13, even after controlling for prior levels of problem symptoms. At both time points, the within-time association between the two domains were strong and significant.

As for the externalising-internalising reciprocal links, T1 internalising symptoms are predictive of T2 externalising symptoms, just as T1 externalising symptoms are predictive of T2 internalising symptoms. Notwithstanding, early symptoms of externalising behaviours are still better at forecasting later internalising difficulties ( $\beta = 0.13$ ,  $p < 0.005$ ) instead early internalising predicting later externalising symptoms ( $\beta = 0.05$ ,  $p < 0.005$ ). These significant paths emerged even after accounting for autoregressive effects of individual domains.

None of the controls comprising of socioeconomic risk, global adversity and parent-child closeness measures exerted any effect on the cross-domain paths. Though slightly reduced in magnitude, the cross-domain paths remained significant suggesting that neither parenting factors nor threat of adversities could alter or thwart the developmental cascades.

## DISCUSSION

In the current study, three hypotheses were tested in order to increase understanding of the relationships between two domains of problems behaviours and academic achievement. The results were then collated to address the following three research questions.

1. What are the consequential effects of early externalising and internalising problem behaviours on later academic achievement?

The first hypothesis of adjustment erosion was supported in the study. Findings suggest that externalising problems evident in middle childhood undermined academic achievement in early adolescence. Over and above whatever cascades and bidirectional influences that may have already occurred by the outset of this study, externalising problems evident at age 9 appeared to forecast problems in academic achievement at age 13. This finding is congruent with many past studies which assert that externalising problems in childhood broadly forecast future adjustment. Behaviours that commonly accompany externalising problems (e.g., impulsivity, aggression, delinquency) may directly limit children's opportunities for productive classroom engagement (Chen, Rubin, & Li, 1997). Anti social behaviours are also more likely to incur social rejection by healthy peers and acceptance by more deviant peers. Disruptive behaviour may lead to removal from the classroom altogether, thus further reducing children's opportunities to learn or their motivation to achieve (Schwartz et al., 2006).

Findings in the current study also indicate that internalising symptoms in middle childhood are associated with later academic achievement. Its effect size however is very small. A handful of studies in the past have alluded to this association of internalising difficulties (Flook et al., 2005). However, control for prior achievement has largely been omitted in these studies. It is possible that emotional or peer problems have small impact on academic achievement, but only small effects emerge when longitudinal stability in academic achievement is controlled.

It is also possible that development of internalising symptoms occur over shorter period of time. Hence, the long interval between the two-time points in this study might have failed to fully capture the longitudinal cascade effect of internalising symptoms. It is also conceivable that negative association in the academic domain occur for subgroups that fall in the clinical range on internalising problems, of which samples in the current study were not tested for.

2. What are the academic effects of early success on later development of externalising and internalising problem behaviours?

The second hypothesis on academic incompetence perspective which posits that initial failures in academic functioning instigate the development of externalising or internalising symptoms was also supported. Early academic success appeared to protect against problem behaviours in early adolescence by desisting the development of externalising and internalising symptoms. This is consistent with literature claims that academic success holds the potential to "minimizing problem behaviour of all kinds" (p. 215), particularly antisocial and risk-taking behaviour (Elder & Conger, 2000). However, the magnitude of the cascade effects was very small (less than a tenth of standard deviation). This could be attributable to physiological and social factors as a result of the transition stage of the participants. At the age of 13, emerging adolescents undergo massive hormonal changes and social challenges in forming their identities and fitting in with peers. Hence, other factors other than academic achievement may account for development of problem behaviours at age 13.

3. Are there reciprocal effects between externalising and internalising problem behaviours over time?

The third hypothesis which asserts reciprocal effects between symptoms of externalising and internalising over time was also supported. There was clear evidence that externalising problems were directly associated with internalising problems both within-time and across time. These reciprocal influences basically imply that children who presented one



domain of problem behaviours at age 9 were likely to display another corresponding set of problem behaviours at age 13. The vast majority of the current sample had transitioned to first year of secondary school by age 13. The classic “dual failure model” (Patterson & Stoolmiller, 1991) explains how when aggressive or hostile children enter new school setting they are likely to be rejected by normative peers who view their anti-social behaviours as undesirable. Peer rejection may lead to reductions in emerging adolescents’ self-worth, contributing to symptoms of depression or anxiety (Capaldi, 1992). Rejection may also increase the risk for drifting into relationships with deviant peers who would reinforce further antisocial behaviour, creating a cascade of reciprocal link between externalising and internalising symptoms over time.

### IMPLICATIONS

The likelihood that function in one domain influences another domain over time bears important implications. Firstly, from a conceptual perspective, these findings signal the importance of models that include both across-time cascade effects as well as within-time associations that co-occurring or sequential problems could arise. From a methodological standpoint, such findings underscore the importance of assessing multiple domains of behaviour repeatedly over time in order that across-time cascades can be differentiated from within-time associations which were present at the beginning of a study and carried forward in time.

From the intervention perspective, it becomes critical to study the processes, and timing of spreading effects. Given effects that spread over time for externalising and internalising problem behaviours, well-timed and targeted interventions could interrupt negative or promote positive cascades. These efforts may work by counteracting negative cascades (e.g. externalising to academic), by targeting the reduction of problems in domains that often cascade to cause other problems (externalising to internalising), or by targeting improvements in domains that desist the development of problem behaviours (e.g. academic to externalising).

From an educational perspective, given problem behaviours erode academic achievement over time and that stability (continuity) within each domain is strong, early detection and treatment becomes important, not only to alleviate suffering related to the symptoms, but also to prevent further damage in academic functioning. Symptoms that undermine academic achievement during primary school years, for example, could influence perceived success and subjective well-being as academic problems occur and could also be very costly over time in terms of subsequent attainment in other domains (Masten et al., 2005).

### STRENGTH OF THE STUDY

The present study builds upon previous research in several ways. Firstly, the scope of the study is unprecedented as data is drawn from a large scale longitudinal study representative of a national population of children. Secondly, autoregressive modelling controls for within-time association and across time stability. Without controlling for covariation and continuity, it is difficult to establish whether there is a unique and cumulative cascade effect from one domain to another over time and when this might be coming. Thirdly, clustering effects due to the nestedness of the data within schools are addressed so that school-level effects can be isolated from child-level effects, making the findings on the child-level observations more accurate.

### LIMITATIONS

Firstly, the current study only has two measurement points. It is argued that a true cascade model should consist of at least three measurement time points to account for concurrent and homotypic associations throughout the entire model (Masten et al, 2006). Secondly, even though three controls were included in the model (parenting, global adversity and socioeconomic adversity), intelligence was not one of them. Intellectual aptitude has been implicated to be a reliable marker of academic achievement (Masten, 2005). Fourthly, the current study has operationalised peer difficulties to be a part of internalising problem behaviours. Future studies may wish to consider peer social

competence as a domain of developmental task on its own. Literature on peer relationships strongly suggests cascade effects between peer acceptance/friendship, externalising and internalising symptoms that need to be examined further from the perspective of developmental cascades. Fifthly, the samples in this study are not tested clinically for symptoms of psychopathology. Both internalising and externalising problem behaviours in the current study are operationalised very narrowly using only a limited range of manifested behaviours. Therefore, it remains to be seen if cascade effects differ in the extremely maladaptive range of symptoms or above diagnostic thresholds.

### CONCLUSION

The study of linkages among multiple domains of developmental tasks is important for theory, policy and practice. Knowledge of directional effects, within-time association and stability of domains helps to specify processes underlying developmental adaptation. Clear understanding of when and how cascades occurs promises to inform strategic preventions and interventions. This study suggests that one way to prevent deterioration in academic achievement in early adolescence is to intervene in externalising and internalising difficulties presented in middle childhood.

### ACKNOWLEDGEMENT

The research reported in this paper is part of a larger study called the Growing Up in Ireland (GUI) Study, an Irish Government-funded study of children being carried out jointly by the Irish Economic and Social Research Institute (ESRI) and Trinity College Dublin (where the author was based). The data for the current study was first collected in 2006 when the children were 9-year-olds (Child Cohort). The members of the Child Cohort are now aged 18 years and a third wave of data has since been undertaken on this same cohort.

### REFERENCES

- Ansary, N. S., & Luthar, S. S. (2009). Distress and academic achievement among adolescents of affluence: A study of externalizing and internalizing problem behaviors and school performance. *Development and Psychopathology, 21*, 319–341.
- Blair, C. (2010). Stress and the development of self-regulation in context. *Child Development Perspectives, 3*, 181–188.
- Bornstein, M. H., Hahn, C. S., & Suwalsky, J. T. (2013). Developmental pathways among adaptive functioning and externalising and internalising behavioural problems: cascades from childhood into adolescence. *Applied Developmental Science, 17*(2), 76–87.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371–399.
- Burks, V. S., Dodge, K. A., & Price, J. M. (1995). Models of internalizing outcomes of early rejection. *Development and Psychopathology, 7*, 683–695.
- Campbell, S.B., Shaw, D.S., & Gilliom, M. (2000). Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467–488.
- Capaldi, D. M. (1992). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: Pt. II. A 2 - year follow-up at grade 8. *Development and Psychopathology, 4*, 125–144.
- Carlson, G. A., & Cantwell, D. P. (1980). Unmasking masked depression in children and adolescents. *American Journal of Psychiatry, 137*, 445–449.
- Chen, X., Rubin, K. H., & Li, D. (1997). Relation between academic achievement and social adjustment: Evidence from Chinese children. *Developmental Psychology, 33*, 518–525.
- Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behaviour. *American Psychologist, 54*, 755–764.
- Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., et al. (2007). School readiness and

- later achievement. *Developmental Psychology*, 43, 1428–1446.
- Geiser, C. (2012). *Data Analysis with Mplus: Methodology in the Social Sciences*. Guilford Press. Kindle Edition. pp. 232.
- Gilliom, M., Shaw, D. S., Beck, J. E., Schonberg, M. A., & Lukon, J. L. (2002). Anger regulation in disadvantaged preschool boys: Strategies, antecedents, and the development of self-control. *Developmental Psychology*, 38, 222–235.
- Educational Research Centre (2016). Ability and aptitude tests. Retrieved from <http://www.erc.ie/test-sales/ability-and-aptitude-tests/>
- Eisenberg, N., Cumberland, A., Spinrad, L., Fabes, A., Shepard A., & Reiser, M. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behaviour. *Child Development*, 72, 1112–1134
- Elder, G. H., Jr., & Conger, R. D. (2000). *Children of the land: Adversity and success in rural America*. Chicago: University of Chicago Press.
- Flook, L., Repetti, R. L., & Ullman, J. B. (2005). Classroom social experiences as predictors of academic performance. *Developmental Psychology*, 41, 319–327.
- Hawkins, J. D., Catalano, R. F., Kosterman, R., Abott, R. D., & Hill, K. G. (1999). Preventing adolescent health-risk behavior by strengthening protection during childhood. *Archives of Pediatrics and Adolescent Medicine*, 153, 226–234.
- Herman, K. C., Lambert, S. F., Reinke, W. M., & Ialongo, N. S. (2008). Low academic competence in first grade as a risk factor for depressive cognitions and symptoms in middle school. *Journal of Counselling Psychology*, 55, 400–410.
- Hinshaw, S. P., & Anderson, C. A. (1996). Conduct and oppositional defiant disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (pp. 113–149). New York: Guilford Press.
- Kohlberg, L., LaCrosse, J., & Ricks, D. (1972). The predictability of adult mental health from childhood behaviour. In B. B. Wolman (Ed.), *Manual of child psychopathology* (pp. 1217–1284). New York: McGraw-Hill.
- Maughan, B., Rowe, R., Loeber, R., & Stouthamer-Louber, M. (2003). Reading problems and depressed mood. *Journal of Abnormal Child Psychology*, 31(2), 219–229.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J.R., (2005). Developmental cascades: Linking academic achievement and externalising and internalising symptoms over 20 years. *Developmental Psychology*, 41, 733–749.
- Masten, A. S., Obradović, J., & Burt, K. B. (2006). Resilience in emerging adulthood: Developmental perspectives on continuity and transformation. In J. J. Arnett & J. L. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 173-190). Washington, DC, US: American Psychological Association, xxii, 340 pp.
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescence-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology*, 14, 179–207.
- Moilanen, K. L., Shaw, D. S., Maxwell, K.L. (2010). Developmental cascades: externalising, internalising, and academic competence from middle childhood to early adolescence. *Development and Psychopathology*, 22, 635–653.
- Muthen, B. O., & Muthen, L. K. (2013). *Mplus user's guide* (7th ed.). Los Angeles: Muthen & Muthen.
- Oland, A., & Shaw, D. S. (2005). Pure vs. co-occurring externalising and internalising symptomatology in children: The potential role of socio-developmental milestones. *Clinical Child and Family Psychology Review*, 8, 247–270.
- Pagani, L., Tremblay, R. E., Vitaro, F., Boulerice, B., & McDuff, P. (2001). Effects of grade retention on academic performance and behavioural development. *Development and Psychopathology*, 13, 297–315.
- Patterson, G. R., & Capaldi, D. M. (1990). A mediational model of boys' depressed mood. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of*

- psychopathology (pp. 141–163). New York: Cambridge University Press.
- Patterson, G. R., & Stoolmiller, M. (1991). Replications of a dual failure model or boys' depressed mood. *Journal of Consulting and Clinical Psychology, 59*, 491–498.
- Reinherz, H. Z., Giaconia, R. M., Pakiz, B., Silverman, A. B., Farst, A. K., & Lefkowitz, E. S. (1993). Psychosocial risk for major depression in late adolescence. *Journal of American Academy of Child & Adolescent Psychiatry, 32*, 1155–1163.
- Risi, S., Gerhardstein, R., & Kistner, J. (2003). Children's classroom peer relationships and subsequent educational outcomes. *Journal of Child and Adolescent Psychology, 32*(3), 351–361.
- Roeser, R., Eccles, J. S., & Sameroff, A. J. (2000). School as a context of early adolescents' academic and social-emotional development: A summary of research findings. *Elementary School Journal, 100*, 443–471.
- Roeser, R. W., Van der Wolf, K., & Strobel, K. R. (2001). On the relation between social-emotional and school functioning during early adolescence: preliminary findings from Dutch and American samples. *Journal of School Psychology, 39*, 111–139.
- Sameroff, A. J. (2000). Developmental systems and psychopathology. *Development and Psychopathology, 12*, 297–312.
- Schafer, J. L. (1997). *Analysis of incomplete multivariate data*. London: Chapman & Hall.
- Schwartz, D., Gorman, A. H., Nakamoto, & McKay (2006). Popularity, social acceptance, and aggression in adolescent peer groups: links with academic performance and school attendance. *Developmental Psychology, 42* (6), 1116–1127.
- Thelen, E. (1989). Self-organization in developmental processes: Can systems approaches work? In M. R. Gunnar & E. Thelen (Eds.), *Systems and development: The Minnesota Symposia on Child Psychology* (Vol. 22, pp. 77–117). Hillsdale, NJ: Erlbaum.
- Thornberry, T. P., Lizotte, A. J., Krohn, M. D., Smith, C. A., & Porter, P. K. (2003). Causes and consequences of delinquency: Findings from the Rochester Youth Development Study. In T. P. Thornberry & M. D. Krohn (Eds.), *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies* (pp. 11–46). New York: Kluwer Academic/ Plenum Press.