

The influence of parental aspirations on students' dispositions to study further mathematics in Higher Education

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The influence of parental aspirations on adolescent students' dispositions to study further mathematics in Higher Education (HE) has not been investigated thoroughly. The aim of this PhD study is to investigate students' perceptions of parental influence on their dispositions to study further maths both quantitatively and qualitatively. A scale was designed to measure students' perceived parental aspirations, motivation to learn mathematics and maths self-efficacy. The questionnaire was distributed to 300 students in Cyprus and the statistical results indicated that parental influence was not statistically significant ($p=0.98$). Moreover 22 students' perceptions of parental influence were examined through individual interviews. We argue that parental influence is subconscious and we draw on Bourdieu's concepts of habitus and capital to discuss the findings.

Keywords: maths self-efficacy, parental influence, dispositions, habitus

Background Literature and Theoretical Framework

There is a large body of literature emphasizing the importance of parental influence and its impact on students' attainment and attitudes to mathematics (Fan and Chen 2001). Students' dispositions towards mathematics influence their decisions to pursue further studies in mathematically demanding courses in higher education (HE). The present study aimed to investigate parental factors affecting students' dispositions to study further maths and the role of parental aspirations in particular. Despite the vast research on parental involvement in primary mathematics (Campbell and Mandel 1990) there is a scarcity of research on parental influence on adolescent students. Students' perceptions of parental expectations influence their attitudes towards maths and their achievement in maths (Aunola et al. 2003). We hypothesise the impact of parental influence on students' decision making to study maths in HE is crucial.

Bloom (1980) argues that parental involvement has been defined in practice as representing many different parental behaviours and parenting practices such as parental aspirations for their children's academic achievement and the conveyance of such aspirations to their children (cited in Fan and Chen 2001). Jacobs and Harvey (2005) define parental expectations as the amount of education that parents would like for their children to have ranging from finishing secondary education to postgraduate university degree. Moreover Wentzel (1998) defines parental aspirations as standards or goals for performance that organize and direct parents' behaviour towards their children. Notably there is some inconsistency in the terminology used in the literature to define parental aspirations.

A powerful theoretical concept that attempts to explain the impact of socio-cultural background to a child's scholastic development is that of cultural capital. The concept was introduced and developed by Bourdieu (1986; Bourdieu and Passeron, 1990) who argued that different types of preferences, attitudes and behaviours are

differentially valued in school settings. Bourdieu (1986) defined capital as those resources whose distributions defines the social structure and whose deployment figures centrally in the reproduction of that structure. Such resources are not just economic, but also social and cultural. ‘Economic’ capital consists of financial stock and income and may be institutionalized in forms of inheritance. ‘Social’ capital includes social networks and identities of individuals as member of social groups, which provide ‘connections’ as assets. ‘Cultural’ capital consists of a large number of types of cultural knowledge and possessions including educational credentials. Even though in introducing the concept of cultural capital, Bourdieu did not focus on school-family interactions, he points out the importance of class and social reproduction through the educational system.

Methodology

A mixed methods research design was implemented to investigate students’ perceived parental aspirations and influence on their dispositions to study further maths in HE. The sample of the study consists of 300 students attending upper secondary schools (lyceums) in Cyprus who completed the survey and 22 students’ individual interviews. A questionnaire was designed to measure students’ prior maths achievement (MACH), motivation to learn mathematics (MOT), perceived parental aspirations (PAR), and maths self-efficacy (MSE).

Students self-reported their prior maths achievement (a grade out of 20). Schoenfeld’s (1992) scale was adopted to measure students’ motivation to learn mathematics (MOT). Some items were adopted from Marchant et al. (2001) to measure perceived parental aspirations (PAR) i.e. “*My parents encourage me to do my best at school*”. The PAR scale had 7 items with 4 point Likert-type responses ranging from 1 = Strongly disagree to 4 = Strongly agree. The items for the MSE scale were designed according to the mathematics curriculum for each year group. Students were asked to rate their confidence to solve each maths problem ranging from 1= Not confident at all to 4 = Very confident.

Results

Various regression models were built in the statistical package R to model Cypriot students’ dispositions (DISP) to study further mathematics in HE with PAR and other variables as explanatory variables. Students’ prior math achievement (MACH), motivation to learn maths (MOT), maths self-efficacy (MSE), maths course and socio-economic status (SES) were included in the final model.

Table 1: Regression parameters for the final model built in R

	DISP ~ MACH + MOT + MSE + PAR + MATHS.COURSE + SES			
	Estimate	Std.error	t- value	p-value
(Intercept)	-1.479072	0.674327	-2.193	0.0301 *
MACH	0.178119	0.039143	4.551	1.24e -05 ***
MOT	0.805316	0.129420	6.223	6.54e-09 ***
MSE	0.114814	0.138436	0.829	0.4085
PAR	0.004725	0.154264	0.031	0.9756
MATHS.COURSE	-0.640622	0.292117	-2.193	0.0301 *
SES [T.low]	-0.458178	0.275362	-1.664	0.0986 .
SES [T.medium]	-0.443425	0.249913	-1.774	0.0784 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Surprisingly students' perceived parental influence (PAR) was not statistically significant in any model for predicting students' dispositions to study further maths (DISP) whereas other variables such as students' prior maths achievement (MACH), motivation to learn maths (MOT) and maths course (Advanced or Core mathematics) were statistically significant as Table 1 exemplifies.

Qualitative Data analysis

The qualitative data of the study were coded in Atlas-ti. An open coding approach was adopted in order to identify the core categories of perceived parental influence that emerged from the interviews. The qualitative data of the study provide some explanations as to why PAR was not statistically significant in any of the models. Stauri explains why she wasn't influenced by her parents to choose Advanced maths:

Interviewer: Did they tell you choose Advanced maths?

Stauri: No they never told me that because they knew I would never choose Advanced maths even if they beg me to. They know I don't like maths so what can they say? I wouldn't do well if I had chosen Advanced maths.

Regarding their choices for future studies in HE, students tended to argue that their parents would support their decisions but '*it is their choice*' if they are going to pursue further studies or not.

They trust my choices. And they know they can't change my opinion so I made my choices as I like. As long as I pass [the university entrance exams], as long as I study something... That's my parents' goal.

While most students denied their parents' influence on their choices yet it appeared that parental influence was mediated by the working experience parents provided for their children in order to get them interested in a certain area.

Georgia: I think I was a bit influenced by my mum who is a nurse because I went and saw some things that made me want to follow medicine.

Interviewer: You mean you went to the hospital?

Georgia: Yeah and I observed an operation and some other things that made me choose what I want.

Similarly Christina, who has chosen to become a Chartered Accountant, argues this was her own choice. Nevertheless her mum advised her to start private tutorials in Accountancy.

My mum wanted, she told me to find a job which pays off well and it's nice and she told me about Chartered Accountant. She told me about this job that's why I started tutorials in Accountancy. It wasn't her choice, I just said I should give it a chance to see what is this that she is suggesting. I liked it at the end and now this is it.

Discussion

A surprising finding of the present study was that perceived parental influence did not have a statistically significant effect on students' dispositions to study further mathematics. This finding seems to contradict other researchers' claims (Aunola et al. 2003) that parental aspirations have an impact on students' attitudes towards mathematics. These contradictory results with the literature might be due to the fact that in the present study parental aspirations were reported by students. If parents had

self-reported their aspirations for their children's future education, maybe parental aspirations would have been proven statistically significant as the literature suggests (Neuenschwander et al. 2007).

The present study brought to light different ways in which students perceive parental influence mostly through the qualitative data collected with semi-structured interviews. A plausible explanation why students said they were not influenced by their parents can be attributed to their age. At this age adolescents urge for autonomy, as some students mentioned they are now '*becoming almost independent*'. This finding adds additional support to Neuenschwander's et al. (2007) argument that

as students seek more autonomy from their parents in adolescence they begin to reflect upon and to disagree with their parents' attitudes and beliefs. We expect that parents' expectations may lose some of their predictive power across adolescence (p.601).

More importantly than this though, students in adolescence go through an identity formation period which might explain why they will assert they are not influenced by their parents in their choices. Beyers and Goossens (2008) argue that identity formation is a dynamic process of person-context interactions, and parents are part of this context, even in late adolescence: "parenting and identity formation are dynamically interlinked, and underscore that parents keep being an important source of socialization for their developing children, even in late adolescence" (p.165).

Although these teenagers tried to preserve their identity as autonomous and independent personalities by denying that they were influenced by their parents, this influence might well still exist but be unconscious, mediated by values acquired at a younger age. Beyers and Goossens (2008) stress that a combination of a warm and close relationship with parents, and parental encouragement of autonomy is associated with healthy identity development. "Parents might react positively when the adolescent makes an autonomous choice of his or her study or career, rather than actively encouraging the adolescent to make such a choice" (p.169). Thus, the 'uninfluenced' student unconsciously makes the 'right' decision for their parents by autonomously making their own decision.

We conceptualise students' dispositions to study further mathematics in the field of HE as part of their *habitus* and apparently parental influence on habitus is largely subconscious. Students' dispositions to study further mathematics in HE might partly be a result of the habitus their families have inculcated.

...pedagogic work accomplished by the family is a function of the distance between the habitus it tends to inculcate, and the habitus inculcated by all previous forms of pedagogic work. (Bourdieu and Passeron 1990, p.72)

According to Bourdieu (1990) it is through the workings of habitus that practice (agency) is linked with capital and field (structure). Bourdieu views the dispositions, which make up habitus, as the products of opportunities and constraints framing the individual's earlier life experiences (Reay 2004). A person's individual history is constitutive of habitus, but so also is the whole collective history of family and class that the individual is a member of:

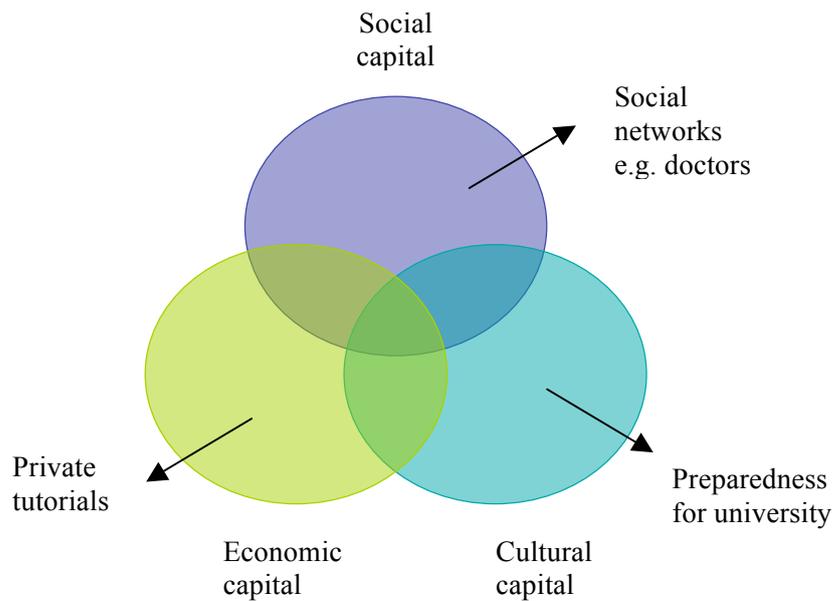
The habitus acquired in the family is at the basis of the structuring of school experiences [...] the habitus transformed by the action of the school, itself diversified, is in turn at the basis of all subsequent experiences, from restructuring to restructuring. (Bourdieu 1972, cited in Reay, 2004, p.434)

Therefore, although the habitus is a product of early childhood experience, and in particular socialization within the family, it is continually restructured by

individuals; schooling in particular acts to provide a general disposition, a turn towards what Bourdieu terms a ‘cultured habitus’ (Reay 2004). Choice is at the heart of habitus, which he likens to ‘the art of inventing’ (Bourdieu, 1990, cited in Reay 2004, 435) but at the same time the choices inscribed in the habitus are limited. Within Bourdieu’s theoretical framework individuals are circumscribed by an internalized framework that makes some possibilities inconceivable, others improbable and a limited range acceptable.

Although the majority of students who participated in this study claim “*It’s my choice*” and deny the influence of their parents’ aspirations on their dispositions to study further maths in HE, they draw on their parents’ capital to form their dispositions towards mathematics. The economic, social and cultural capital of the parents is evident: they benefit from expensive private tutorials (see Christina) and visit their parents’ workplace (see Georgia). Most of them seem to be well informed about university and well prepared for it (see Stauri). We argue that these are instances of the economic, social and cultural capital offered by the parents and their utilization enhance their children’s education. Figure 1 illustrates this relationship diagrammatically.

Figure 1: Bourdieu’s theoretical framework of capital and perceived parental influence



Conclusion

Our statistical analysis showed that perceived parental influence on students’ dispositions to study further maths in HE was not statistically significant but the qualitative data provide evidence of parental influence which is subtle, and largely ‘denied’. Students coming from middle class families in Cyprus often deny their parents’ influence on them but they draw on their parents’ economic, social and cultural capital to form their habitus, including dispositions towards mathematics. We argue that students’ perceptions of parental influence might not correspond to their parents’ actual aspirations or influence, which remain hidden but are all the more powerful because they are relatively invisible. This particular realisation of misrecognition of parental influence can be partly attributed to the students’ age;

adolescent students press for autonomy and try to preserve their identity as independent personalities. How parental influence is mediated by sociocultural capital and the ways parents communicate their aspirations to their children while promoting their autonomy still deserves to be further investigated.

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