

The effects of birth order on personality traits and feelings of academic sibling rivalry

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Abstract

The influence of birth order on personality and sibling rivalry is controversial; little research has been conducted into academic sibling rivalry, and none into the connection with personality traits. This study considers the interaction of all three factors. Firstborns (N=22) and lastborns (N=24) completed online personality tests and an Academic Sibling Rivalry Questionnaire. Lastborns were found to experience more academic sibling rivalry: $t=2.33$, $DF=44$; $p<.05$, whereas firstborns are more likely to be conscientious: $F(1,44)=3.58$; $p<.05$, and dutiful: $F(1,44)=5.39$; $p<.05$. This raises possible implications in domains including education, health and psychotherapy. Further research could be conducted to expand these findings in terms of variables and geographical location.

IN THE GALAPAGOS ISLANDS Charles Darwin (1859) found 13 variations of finch and concluded that these variations had emerged as the most suitable for that time and that environment through natural selection. Darwin proposed that the 'fittest' variations within a species were the most likely to survive and reproduce and therefore more likely to pass on their genetic traits; the 'survival of the fittest'. Darwin believed that it was survival of the fittest that resulted in offspring (sibling) rivalry. Rivalry can certainly be found within a plethora of biological contexts, for example the first Indian Black Plum tree ovule releases a 'death chemical' to starve and kill other Black Plum ovules (Krishnamurthy, Shaanker & Ganeshiah, 1997); the first African Black eagle chick to hatch pecks the other chick to death (Mock, Drummond & Stinson, 1990; Mock & Parker, 1998); 25 per cent of Spotted Hyena offspring succumb to sibling aggression, increasing to 50 per cent within same-sex litters (Hamilton, 1967). Hamilton (1964; Trivers, 1974) suggests that sibling rivalry is a means of competing for scarce resources – as long as the benefits are greater than twice the cost. Thus natural selection includes the biological disposition of offspring to compete against

each other for not only survival, but also parental favour. Sibling rivalry can be described as 'the jealousy, competition and fighting between brothers and sisters' (University of Michigan Health System, 2007. pp1) and is common when there is more than one sibling in a family (Johnson, 1998). Trivers (1974) points out that every child initially sees himself as more important than his siblings (twice as valuable) and needs to be taught to share and be kind.

There are of course instances in other biological kinds whereby siblings support, rather than fight against each other for the benefit of the species: Trivers (1985) described how Taiwanese aphids work together; the firstborn will become the 'soldier' and protect the second-born who will become the 'reproductive' caste. Hamilton (1964) suggests that altruism may be a result of natural selection by re-focusing on the genetic rather than the individual level: interest is in the gene pool if it enables more individuals to survive (inclusive fitness as opposed to survival of the fittest).

Sibling rivalry amongst humans

The scale of influence of evolutionary factors on human behaviour relative to culture and

social construction is open to debate; clearly social or environmental factors play a part. Sulloway (2001; *p*40) discusses ultimate and proximate influences on sibling behaviour: ultimate causes of behaviour are 'adaptive tendencies that have evolved by natural selection', and encompass Darwin's theory of natural selection and the biological disposition to compete for parental focus and attention to survive childhood, whereas proximate causes of behaviour are due to 'influences operating during the lifetime...biological as well as environmental factors, which almost always interact with one another'. These influences include varying environmental situations that the individual must react to, to successfully proceed through life and survive natural selection. For example, bird migration is an ultimate adaptation based on natural selection, however, the immediate triggers for migration – the proximate causes – may include temperature and length of daylight (Mayr, 1961). Therefore, the cause of human sibling rivalry may ultimately be traced back to natural selection (Sulloway's ultimate influence), however, the way in which an individual conducts their rivalry depends on immediate, or proximate environmental, social and situational factors (Sulloway's proximate influence).

Siegler (2007) notes a variety of possible non-biological influences on human sibling rivalry: parental conflict; parental favourites – this can increase the rivalry from the 'less-loved' child and can cause guilt in the 'loved' child, and children being encouraged to take on the same hobbies and interests. Lamb and Sutton-Smith (1982) suggest two main types of sibling rivalry influence: adult-initiated and sibling-generated. Adult-initiated can be split into two categories: overt and covert. Overt adult-initiated rivalry includes statements of comparison between two siblings. Covert comparisons would include subtle statements without the direct comparison. Sibling-generated rivalry attempts to gain parental attention and increase status within the sibling relationship.

Birth order and personality influences

Sibling rivalry has been well documented with connection to birth order and personality, however there are still outstanding controversies (with few consistent findings; Schooler, 1972) over the types of rivalry investigated. Adler (1927; Leman, 1985) remarked that birth order is a great contributor to why children of the same family, with similar genes, end up with very different personalities. Adler claimed that the firstborn child experiences the 'only child life' and is centre of attention until the second-born child arrives, which can cause anger and frustration. If the situation is handled appropriately, the firstborn child could develop into a responsible, protective person. However, in extreme cases when the situation is handled inappropriately, the firstborn can become neurotic and criminal. Adler characterises lastborns as ambitious but spoiled: this child is constantly trying to catch-up with or surpass the eldest child but is more likely to become a neurotic problem child. Sulloway (2001; 1996) claims that firstborns seek parental approval by taking on the role of surrogate parent to their sibling (leading to conscientiousness), whereas laterborns, unable to take on this surrogate role, develop new talents and seek new interests and activities within the family in order to prove that they are worthy of attention (leading to openness to experience). Roach (1997) replicated Sulloway's work cross-culturally, among several hundred horticulturalist Shuar Indians, and found nearly identical correlations between birth order and personality traits. Sulloway (2001) claimed evidence that firstborns are more likely to be more conscientious and socially dominant, but less agreeable and open to new experiences than laterborns. He also notes different competitive strategies between firstborns and laterborns: firstborns – being generally bigger – tend to use more physical dominance and intimidation, whereas laterborns tend to use techniques of whining, humour and social intelligence.

Zajonc and Mullaly (1997; Zajonc, 2001;

Downey, 2001) found that firstborns had a more intellectually stimulating environment than laterborns – the confluence model – which, influenced the likelihood of differing personality traits between firstborns and laterborns. Zajonc and Mullally commented that firstborns experience the ‘tutor effect’ (teaching their younger siblings) and their intelligence benefits from this. Retherford and Sewell (1991) carried out developmental and cross-cultural studies testing this notion, and found supporting evidence with controlled samples.

Other issues have been noted about gender and age potentially creating, enhancing or reducing rivalry. Rimm (2002) suggested that the closer in age two same-sex siblings are, the more likely it is that there will be competition between them and suggests that this is because they are expected to like the same things, act in the same way and achieve the same standards. Sulloway (1996; Chu, Yu and Tsay, 2004) agreed and stated that greater birth spacing between siblings helps to reduce sibling rivalry: there is less resource competition, and it is more likely that the elder sibling will support the younger sibling, however Johnson (1998) found no correlation between large birth spacing and reduced sibling rivalry. It has been found that female siblings are more likely to play a supportive rather than a competitive role, compared to males (Greenhalgh, 1985).

Sibling rivalry and real life

McNerney and Usner (2001) conducted an investigation into sibling rivalry across the lifespan. They investigated the intensity and degree of rivalry experienced by 85 college students at various stages of their life in three domains: academic, social and physical; 54/85 described their relationship with their sibling as competitive. The age ranges (0-25 in five year increments) were chosen to represent the most ‘important developmental stages in a person’s life’ (p1). Participants completed McNerney and Usner’s sibling rivalry survey containing seven questions,

with various sub-questions, asking about rivalry at different age ranges and in the three domains. They found that 56 per cent of individuals had experienced the most sibling rivalry between the ages of 10-15 years, and the greatest rivalry (38 per cent) had occurred within an academic setting. They also found that students aged 20-25 rated academic sibling rivalry very high: 65 per cent, with social sibling rivalry at about 30 per cent. Between the ages of 20-25, an individual at college or university has many academic pressures as they strive for achievement and status. When individuals reach this stage in their education, academic rivalry is no longer just about parental favour, but also includes competition for respect, status and job prospects: achieving a higher degree is not just seen as a sense of academic accomplishment, but as a means of securing a higher status career.

Although sibling rivalry is seen as a natural part of sibling life, if it becomes too severe it can cause a multitude of problems within the family. Sibling rivalry has been found to become so extreme in some families that it has led to marital problems, or members of the family having been physically hurt; it has led to a loss of self-esteem, with psychological well-being having deteriorated. Some family members have even had to seek advice and help from psychologists, psychiatrists and other mental health authorities (Sibling Rivalry Disorder, 2007). Sibling rivalry does not necessarily decrease with age spacing, number of parents, number of siblings within the family (Johnson, 1998), nor does it decrease throughout the lifespan (McNerney & Usner, 2001), although it may change in focus. By furthering knowledge of sibling rivalries in a range of situations it may be possible to develop interventions to provide coping strategies and support for children suffering with sibling rivalry.

The aim of this study is to expand on the research on sibling rivalry. There are a number of variables that could affect sibling rivalry, including gender, birth order, age difference, parental or environmental influ-

ences, and there are a number of circumstances within which rivalry could occur: home, school, job, social settings and even physical appearance. Acknowledging the difficulties of researching each separate variable, the previous research undertaken has been limited and much of the existing research has conflicting evidence.

This study will focus on academic sibling rivalry, thought by McNerney and Usner (2001) to be the most prominent form of sibling rivalry between the ages of 10 and 25, and could therefore be seen as the most important form to be studied. This study will look at whether birth order or certain personality traits enhance the likelihood of experiencing academic sibling rivalry.

Three hypotheses were formulated: firstly, there will be a difference in academic sibling rivalry scores between lastborn participants and firstborn participants. Secondly, there will be a difference in Conscientiousness scores, with firstborn participants scoring higher than lastborn participants. Finally, there will be a difference in Openness to Experience and Agreeableness scores, with lastborn participants scoring higher than firstborn participants. The second and third hypotheses were derived from Sulloway's (1996) research into birth order and personality, and were therefore *a priori*.

Methodology

An opportunity sample of forty-six psychology students was recruited through a research participation scheme. There were 22 firstborns (M=19.41 years, range 18-27; three males and 19 females) and 24 lastborns (M=19.91 years, range 18-25; five males, 19 females). Participants were all native English speakers, and had only one sibling. Participants individually completed two measures with order of presentation counterbalanced. Personality was measured by the IPIP-NEO (International Personality Item Pool: an online representation of the NEO PI-R; Costa & McCrae, 1992). The five-point Likert scale IPIP-NEO contains 120

items; each item relates to one of five factors: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience, all of which have six sub-factors. The second, paper-based, measure, the Academic Sibling Rivalry Questionnaire was devised for this study and comprised of 20 items with five-point Likert scale responses. Items were developed with the aid of focus group responses. For example:

M1: 'My sister and my dad had like this special connection because they are both similarly-minded, mathematically-minded and they love all that kind of stuff and I used to get really upset about stuff like that.'

E1: 'My parents still say, well this is what your sister did, would you not be interested in doing that? My brother was always compared to me.'

Participants remarked that parents could have a significant influence on feelings of academic sibling rivalry, therefore items were created to reflect this: 'I feel my parents compare my sibling and me', and 'I am pleased for my sibling if my parents praise them for their achievements'.

E2: 'The sibling rivalry in my family came, not necessarily from the parents but from the teachers at school. They actually compared us more than our parents ever did. Stuff was said to my sister before she'd even shown her character because they knew me and they were judging her on my standards.'

Furthermore, some participants felt that teachers could also contribute to this rivalry, therefore items were created in accordance with this: 'It does not bother me if teachers compare my sibling and me'

E3: 'There was always more academic rivalry with my little brother because we're more similar: he's good at things I'm

good at. I'd never help my brother with work because he doesn't do as much work as I did.'

All participants commented about personal academic feelings towards their siblings, therefore items were created such as 'I often compare my academic successes against my sibling's successes', and 'I feel I deserve better grades than my sibling'.

A pilot study of 21 participants was conducted; comments about clarity, ambiguities and structure were accepted and the questionnaire was altered. Piloting ensured satisfactory test - re-test reliability ($r(20)=0.95$, $p<.001$) and internal validity (through item analysis) was carried out in developing the final version; ten items were discarded, leaving twenty highly discriminating items within the questionnaire.

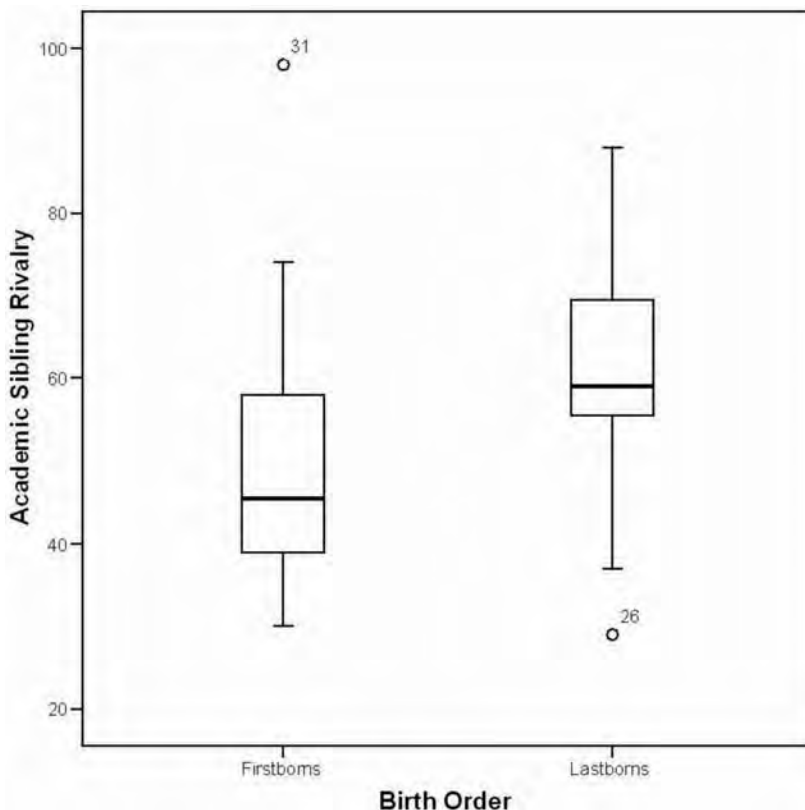
Results

When the items for the IPIP-NEO are scored, a result is given for each of the 5 factors and each of their 6 sub-factors; these are a matter of degree, two people can be rated as 'extraverts', but one can be more extraverted than the other. A score of 60, for example, means that your level on that factor is estimated to be higher than 60 per cent of persons of your age-range and sex (IPIP-NEO online).

Birth order and academic sibling rivalry

Preliminary analyses showed that there was a difference in levels of academic sibling rivalry dependent on birth order. Lastborns experienced higher, and less variable, rates of academic sibling rivalry ($M=60.38$; $SD=13.53$) compared to firstborns ($M=50.18$, $SD=16.11$), as shown in Figure 1.

Figure 1: Mean academic sibling rivalry questionnaire scores for firstborn and lastborn participants



The mean difference between conditions was 10.19; the 95 per cent confidence interval for the estimated population mean difference is between 1.38 and 19.09. $T=2.33$, $DF=44$; $p<.05$. It was concluded that birth order affects feelings of academic sibling rivalry.

Birth order and personality

Preliminary analyses showed there to be a main difference between birth order and conscientiousness, with firstborns exhibiting higher levels of conscientiousness ($M=54.45$; $SD=7.10$) than lastborns ($M=38.88$; $SD=28.64$).

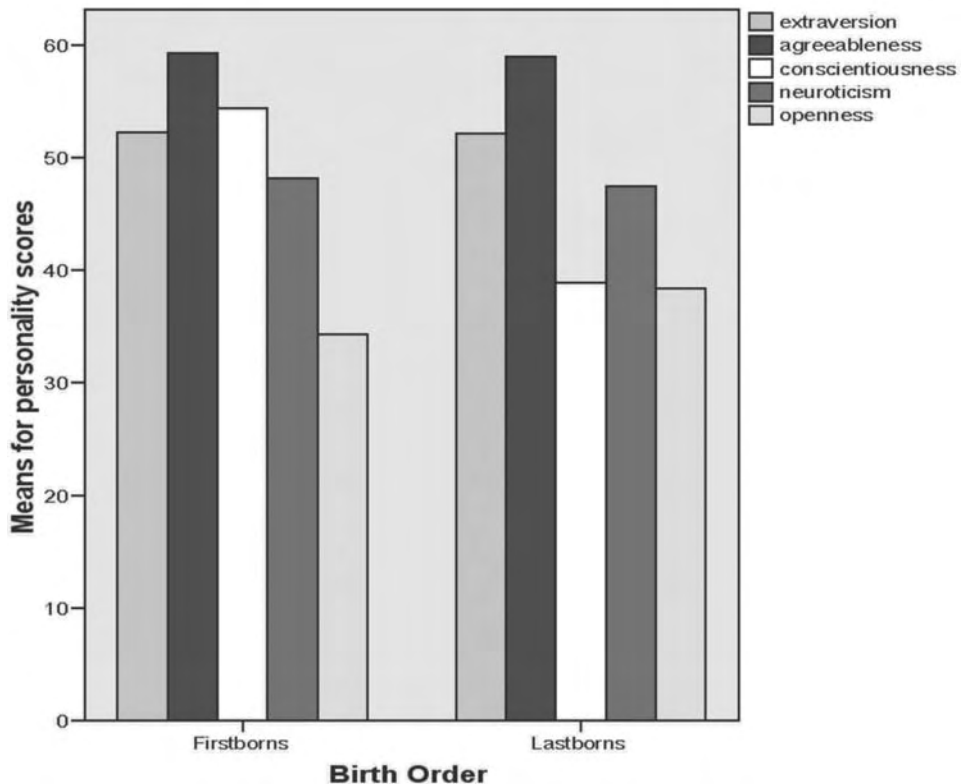
An independent one-way MANOVA was conducted to investigate birth order differences in personality factors. The five DVs were extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.

The IV was birth order of the participant. There was no significant difference overall between firstborns and lastborns on the combined DVs: $F(5,40)=.75$; $p=.59$. Wilks' Lambda=.91; partial eta squared=.09. A priori comparisons on conscientiousness, openness to experience and agreeableness enable one-tailed analyses; when considered separately, only conscientiousness reached significance at the .05 level: $F(1,44)=3.58$; $p<.05$. Firstborns scored higher for conscientiousness compared to lastborns (see Figure 2).

Birth order and conscientiousness sub-factors

An independent one-way MANOVA was conducted to investigate birth order differences

Figure 2: Firstborns are more conscientious than lastborns: Scores on the big five personality factors



in the six sub-factors of conscientiousness. The six DVs were self-efficacy, orderliness, dutifulness, achievement-striving, self-discipline, and cautiousness. The IV was birth order of the participant. There was no significant difference overall between firstborns and lastborns on the combined DVs: $F(6,39)=1.77$; $p>.05$. Wilks' Lambda=.79; partial eta squared=.21. When considering the DVs separately, dutifulness was significantly different between birth orders: $F(1,44)=5.39$; $p<.05$, with firstborns scoring higher ($M=59.59$) than lastborns ($M=42.88$).

Gender and sibling gender differences

There was no significant difference between males and females on scores of academic sibling rivalry (males: $M=53.13$; females: 56). Twenty-two participants had a same-sex sibling, and twenty-four participants had a different-sex sibling; however, this appeared to make no significant difference on feelings of academic sibling rivalry: $t=1.38$, $df=44$; $p>.05$.

Descriptive statistics were generated and showed that the only real difference was on the scores for Conscientiousness; firstborns generally scored higher (mean=54.45) than lastborns (mean=38.88). The variation of scores was about the same for each condition (as shown by the standard deviations). The initial plan was to use a parametric t-test to analyse this 'Conscientiousness' data, however, it was important to check whether the data met the parametric assumptions. The visual aids showed no extreme scores and further analysis for the other two assumptions was conducted.

Discussion

A difference in academic sibling rivalry scores between lastborn and firstborn participants was predicted and found. The fact that lastborns experience more academic rivalry may be explained by Rimm (2002) who found that youngest siblings were more likely to feel inadequate compared to eldest siblings. An alternative explanation derives from Zajonc and Mullally (1997) who claim that firstborns generally present as more

intelligent than lastborns as they are provided with a more intellectually stimulating environment, which could explain why lastborn siblings would feel more in competition to 'catch up'.

Two hypotheses derived from Sulloway (1996) were proposed: firstly, a difference in Conscientiousness scores, with firstborns scoring higher than lastborns was predicted and supported. Secondly, a difference in Openness to Experience and Agreeableness scores, with lastborns scoring higher than firstborns was predicted but not supported. It is interesting to note that firstborns score lower on academic sibling rivalry and higher on the Conscientiousness scale. This could be explained by Zajonc and Mullally's 'tutor effect', whereby the elder sibling helps to teach the younger sibling. This may mean that as the siblings grow up, the elder sibling has usually been more conscientious towards the younger sibling in terms of education and therefore feels less academically threatened.

This study focused on university students and university is not only a means to obtaining a good career, but also plays a role in an individual's personal growth and development. This study could therefore have implications at educational and personal levels. Awareness of birth order and links to personality and academic sibling rivalry may be important for students to better understand themselves and possible feelings of rivalry, anxiety, stress or even depression. The academic sibling rivalry differences identified in this study between firstborns and lastborns may influence how these individuals behave educationally.

It has been suggested that sibling rivalry can cause difficulties for families (Sibling Rivalry Disorder, 2007) ranging from within family resentment, to serious physical harm between siblings. If the highest level of rivalry is academic, as McNerney and Usner (2001) suggest, then university may be an appropriate place to help individuals to understand and overcome their rivalry. However there is probably little scope in tutorial

work to make lastborns aware of the possible destructive nature of sibling rivalry and to offer coping strategies, although the topic may be of interest to university counselling services. There may be more scope to include material on sibling rivalry in teaching about undergraduate cognitive, social and emotional development. It is odd that psychology programmes often fail to relate their teaching to students' own early adulthood development. Academic sibling rivalry could find a place here amongst selected material on the development of epistemological reasoning and cognition in undergraduates, individual differences, psychometrics, developmental tasks, relationship formation, personal development planning and approach to study. Enhancing individuals' awareness of possible birth order effects on their educational lives, and helping them to find methods for dealing with these effects could help individuals to focus on what they enjoy doing rather than attempting to overtake their sibling in status and respect. It could help to reduce the extent to which undergraduates focus on degree grade rather than what they are learning.

The results presented here suggest that there is an influence of birth order on academic sibling rivalry. However there are still a range of variables that could have influenced this finding and need further investigation or control. It would be interesting to investigate whether results would be different if only individuals with a similarly academic sibling were recruited. Future research could also investigate both first and last-born siblings from the same family. This would also provide more control over variables such as upbringing, early schooling and socio-economic status. Another important variable to consider is sibling gender; extending this work could allow for the consideration of all four permutations: sister-sister, brother-brother, brother-sister, and sister-brother. This would allow for gender-rivalry investigation and would enable the researchers to see whether one combination of siblings is more likely to experience aca-

demically sibling rivalry. Recruiting siblings from the same families could validate this work further. This way there could be a direct comparison between sibling pairs. Further investigation of the relationship between academic sibling rivalry and other factors influencing academic performance, personal development and employability, such as perfectionism, could be undertaken. There is also scope to locate academic sibling rivalry within broader currents of literature concerning the impact of evolutionary psychology and related concepts, such as sibling rivalry, on mental health, education and personal development.

Finally further work is also required on the concept of sibling rivalry in order to better define it, understand it and know how to measure it. Conceptually it is rooted in evolutionary psychology yet can also be thought of as socially constructed and as contributing to sociological constructions such as social stratification (Armando, 2005). Sibling rivalry is also about family and group dynamics and further input from psychodynamic perspectives may be valuable. It may also be fruitfully connected to non-family group contexts where individuals both compete and combine, school classrooms and playgrounds and military units for example. As demographics change and small or only-child families become more common worldwide, it may be useful to consider the benefits of sibling rivalry and the implications for other social contexts of the loss of siblings to be in rivalry with.

In conclusion previous research suggested that birth order could influence various personality traits such as Conscientiousness, Openness to Experience or Agreeableness, as well as playing a part in sibling rivalry. However, only a limited amount of research had investigated the influence that birth order could have on experiencing feelings of academic sibling rivalry. Participants in this study did show certain differences concerning personality traits, although only the difference for Conscientiousness was found to be significant. In

addition, this study showed a significant difference concerning feelings of academic sibling rivalry between firstborns and lastborns. However, whether these differences could have any consequential effect is a question for further research in this area. In summary, birth order can influence personality traits and academic sibling rivalry, but further investigation is required before wider generalisations can be made.

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