

GES

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The Game Theory of Childrearing with Respect to Psychological Development

Parenthood always seems to unleash an entirely new competitive fire within a person that makes them want their child to outshine all other children. Whether it is out of love for their new offspring or for protection of their own reputation as a mother or a father, parents undoubtedly want to see their children succeed. And as it turns out, this willingness for parents to provide for their children is rooted in a game theory of childrearing with respect to psychological childhood development. Over the years, through trial and error, parents have learned which tactics and strategies help and hurt their children on their way to maturity. Through experimental studies, psychologists continually try to definitively establish which of these tactics actually help children progress. Parents can derive a true game theory of childrearing with respect to psychological development through manipulating aspects of their child's life from factors like the environment their child is raised in, both in terms of the physical environment they provide for their children and the style of parenting they exhibit, to simply how much they believe in their children. When implemented correctly, this game theory can help a child both in the short run and in the long run.

Started in 1928 with John von Neumann's work on two-person zero-sum games and later expanded upon greatly by John Nash with his proof of the Nash Equilibrium, game theory alludes to a situation in which a person's decisions are based on a strategy that gives them the best chance of obtaining their desired outcome. While game theory can be applied to real games

like poker and chess, it can also be applied to broader aspects of society, like economics and psychology. In doing so, game theory can lay out specific strategies for people to follow in which they are able to maximize their profits or the development of their mind by employing certain tactics that have been proven to lead to better outcomes in these realms. Game theory serves as a way for people to ensure that if they follow the strategies specified by the theory, they should be more successful in their endeavors. This paper discusses game theory as it relates to psychology, specifically demonstrating methods that maximize the way in which a parent can help their child develop psychologically (Dufwenberg 167-171).

The reason Americans feel the need to laud people who fit the “self-made man” mold of American virtue is because going from rags to riches is easier said than done, even in a land of opportunity like the United States. There is scientific proof that a child’s environment, particularly the socioeconomic status in which they are raised, has a serious impact on a child’s IQ and therefore the intellectual development of their mind. In a study conducted by Duyme, researchers manipulated the environment children lived in in order to ascertain its effect on a child’s IQ. The participant children were all orphans who had to meet certain specific criteria: they were all abused as babies, had been shifted around from foster home to foster home, were administered an initial psychometric test that showed they had an IQ between 60-86, and were between the ages of four to six when the trial was started. The children were each then adopted by two parents, and they were all divided among parents with three different levels of socioeconomic status: high, middle, and low. All of the children were then given another psychometric test when they were between the ages of 11 and 18 (Duyme et al.).

The results of the above experiment were very telling as to how much a child’s physical environment affects his or her psychological development. Overall, the mean gain in IQ for all

of the children in the experiment after adoption was statistically significant with an average gain of 13.9 IQ points per child. Since an increase in IQ indicates some form of intellectual development in a person's mind, this result demonstrates how the transition from the abusive, run-down environment of an orphanage to a well kept home with two parents benefits the intellectual development of a child. More importantly, though, the average increase in IQ points differed significantly based on what socioeconomic status the child was placed in. The average increase in IQ score for children placed into the low socioeconomic status group was 7.7 points, the average increase for children placed into the middle socioeconomic status group was 15.8 points, and the average increase for children placed into a household with a high socioeconomic status was 19.5 points. This demonstrates how beyond just having a physical environment made up of a safe, traditional home life, the more money that is invested into the environment a child grows up in positively impacts that child's intellectual development. This means that, if the game theory of childrearing with respect to psychological development is to be implemented optimally, a child must be provided with a safe home environment in which two parents at a high socioeconomic status provide what is necessary for their children. This increase in intellectual development that occurs as a result of the children growing up in this optimal environment would benefit the children both in the short run and the long run in that a higher level of intelligence leads to more success in both school and career outlook. (Duyne et al.).

In another experiment demonstrating the effects of a child's physical environment on their psychological development, psychologists manipulated the physical environment of both bright and dull rats in order to ascertain the effect this change in their environment would have on intellectual development of the rats. The experiment was based around four groups of rats: a bright group of rats placed into an enriched environment, a dull group of rats placed into an

enriched environment, a bright group of rats placed into a restricted environment, and a dull group of rats placed into a restricted environment. The enriched environment can be compared to the high socioeconomic status environment some children were placed into in the experiment above, whereas the restricted environment can be compared to the orphanage the children were originally from in the experiment above. The participants were all part of bright and dull strains of rats created at McGill University, and the control group was a group of rats raised in what would be considered a normal rat environment. Though both the restricted and enriched cages were the same dimensions, the restricted cages only contained food and water, whereas the enriched cages contained food, water, and lots of toys for the rats to play with. After living in their respective cages for 40 days, the rats were put through a maze and evaluated based on how many errors they made while trying to get out of the maze (Cooper et al.).

As shown in the Tables I and II in the appendix, this experiment also supports the fact that an enriched environment is part of the game theory of childrearing with respect to psychological development. Table I demonstrates how for both bright and dull rats, being in an enriched environment lowered the number of errors the rats made while working through the maze compared to the rats raised in the normal environment. Although the data for the bright rats in Table I was not found to be statistically significant, the data for the dull rats in this table was found to be statistically significant. This further indicates how in the game theory of childrearing with respect to psychological development, being in a more embellished physical environment is part of maximizing the outcome of the game. Likewise, Table II shows how both bright and dull rats raised in a restricted environment had significantly more errors when running the maze than the rats raised in a normal environment. Although that data for the dull rats was not statistically significant, the data for the bright rats was. These results further

underscore the magnitude to which raising a “dull” individual in an enriched environment positively impacts their intellectual development whereas raising a “bright” individual in a restricted environment severely harms their intellectual development. Therefore, as noted in both this example and in the adoption example above, parents can use the fact that raising a child in an embellished environment has a positive impact on the child’s psychological intellectual development to create another strategy as part of their game theory of childrearing with respect to psychological development. Since being smarter can help children in both the short run and in the long run by helping them achieve more success in school and in their future careers, children must be raised in an enriched physical environment if the game theory of childrearing with respect to psychological development is to be played to win.

However, physical environment is not the only aspect of a child’s environment to heavily impact the game theory of their psychological development. Another major part of the environment a child grows up in is the parenting style of their guardians. In her 1991 study on the relationship between parenting style and childhood development, Diana Baumrind was able to define seven specific styles of parenting: authoritative, democratic, authoritarian directive, nonauthoritarian directive, good-enough, nondirective, and unengaged (Baumrind 65). The seven styles were based off of rankings in two categories: how demanding and how responsive the parents were. How demanding parents are is associated with how much they require their children to become incorporated into their family unit (Baumrind 61-62). Responsiveness refers to how good the parents are at providing their children with what they need in order for them to express their own individuality and independence (Baumrind 62). The study found that authoritative parents are both highly demanding and highly responsive, democratic parents are highly responsive and only moderately demanding, directive parents are demanding and not

responsive, good-enough parents are moderately demanding and moderately responsive, nondirective parents are extremely responsive, and unengaged parents are not demanding or responsive (Baumrind 65; Weiss et al. 2101).

The results of this study indicate that the authoritative parents who were both demanding and responsive had the most positive influence on their child's psychological development (Weiss et al. 2101). This is because in times of transition between different stages of childhood, it is important for children to have the support system of their family that keeps them structured through all of the changes they are experiencing in the short run, while at the same time they also need to be able to discover their own individuality in hopes of defining their own identity for the long run. This combination of integration and individuality is defined as the optimal environment for children to grow up in because it keeps children grounded, while also letting them determine their own beliefs (Baumrind 61).

Beyond the fact that the authoritative parenting style best fits the definition of the optimal environment in which to raise a child, there are several reasons why the other styles of parenting are not considered as part of the game theory of childrearing with respect to developmental psychology. First of all, children who came from environments in which the democratic style of parenting was employed exhibited an elevated level of substance abuse compared to children in homes where the authoritative style of parenting was employed. This is bad in that substance abuse can harm children in the short run and the long run by hurting the children physically and by hurting their ability to maintain successful careers and relationships. Likewise, children from homes where the nondirective parenting style was employed were proven to be less capable and less likely to strive for success than children brought up in a household with an authoritative parenting style. This can hurt a child because a lack of ambition can cause people to be less

likely to put in enough effort to achieve their goals, making them less successful both in the short run and in the long run. Likewise, children who experienced directive parenting did not form decent social skills. This is bad in that social skills are essential in forming relationships and building careers, and without them, it becomes difficult to build a successful life. Children from homes where directive or unengaged parenting was employed exhibited low achievement scores, which is also bad for children in that achievement is important for leading a successful lifestyle. Lastly, children who were raised in an environment with a good-enough parenting style were not found to be as competent as the children who experienced authoritative parenting. This is because these parents were only moderately responsive and demanding, whereas authoritative parents were highly responsive and demanding, leading to the fact that children who experienced good-enough parenting were only moderately as competent. Competence is another key to success, indicating once again that the authoritative style of parenting is best when trying to maximize the psychological development of a child (Weiss et al. 2101).

Overall, if the game theory of childrearing with respect to psychological development is to be implemented optimally, the authoritative style of parenting in which the parents are both highly responsive and demanding should be used. This is because this style provides familial support during difficult times of transition, while also providing the necessities that allow the child to establish himself or herself as an individual. Being strong in both of these spheres encourages a stable environment that produces a sound psychological state for development. This secureness in the psychological development of a child in turn promotes a lifestyle that fosters success and achievement both in the short run and in the long run (Weiss et al. 2102).

Lastly, though it may not seem like a big deal, one of the biggest ways to advance the psychological development of a child is just by their parents letting them know they believe in

them. This fact is demonstrated perfectly in a study performed by Rosenthal and Jacobson. In this study, researchers went into an elementary school and tested all of the children with an intelligence test. The researchers told the teachers in the school that the results of this test would distinguish between children who were academic “bloomers” (children who were expected to grow immensely in their academic abilities over the next school year) and children with normal intellectual abilities. However, this test was merely for show, as it was never intended to have any real bearing on the results of the psychological study. Rather, the researchers randomly selected about 20% of the students in each class to be part of the experimental group and told the teachers that these students’ scores on the test indicated that they were academic “bloomers” who were going to grow enormously in their academic abilities in the coming school year.

The results of this study ended up being quite a remarkable bearing on how much a guardian’s belief in their child can impact the child’s psychological development. Though the children selected to represent the academic “bloomers” in reality had no special intellectual abilities compared with those children who were not in the experimental group, these randomly selected children actually ended up gaining significantly more IQ points than the control students during that school year, as shown in Table III in the appendix. This data is also supported in Table IV, which shows the percentage of children in both the experimental group and the control group who gained 10, 20, and 30 IQ points over the course of the experiment. A higher percentage of students in the experimental group demonstrated 10, 20, and 30-point increases in their IQ scores over the course of the experiment. The reason the children in the experimental group were able to increase their IQ scores so much more than the children in the control group is because the teachers believed in the experimental group more. Since the teachers were told which students were expected to be academic “bloomers,” the teachers expected these students to

have more potential and therefore gave them more resources and guidance in their intellectual development, helping to increase these students' IQ scores by a larger margin. In essence, this shows how believing more in a child can impact their psychological development for the better. An increase in IQ score indicates an increase in intelligence, which in turn indicates an increased ability for a child to become successful both in their immediate schoolwork and eventually in their careers. Because of this, another aspect parents can add to their game theory of childrearing with respect to psychological development is to make sure they believe in their children in order to ensure that their children are able to increase their intelligence as much as possible (Rosenthal et al.).

There are several other studies that demonstrate similar results to the study discussed above about parents believing in their children. In another study conducted by Rosenthal and Fode, researchers told a group of students in an experimental psychology course that they were going to conduct a study in which they would randomly be assigned to work with either maze-bright rats or maze-dull rats. The rats were actually not any special strain of maze-bright or maze-dull rats. They were just normal rats randomly assigned to each experimental group. The researchers told the students that the object of the experiment was to replicate results previously found with these rats, notably that the maze-bright rats should show signs of learning when put through a maze, whereas the maze-dull rats should not exhibit any signs of learning. However, the researchers were not actually concerned with whether the students were able to replicate the experimental results. Rather, they were concerned with how the students' preconceived notions of the rats' abilities affected the intellectual development of the rats (Rosenthal et al. (2)).

Indeed, this experiment yielded the same results as the academic bloomer experiment discussed above. As shown in Table V in the appendix, the rats that were considered to be maze-

bright by the experimenters did significantly better at learning how to complete the maze, as can be seen by the number of correct responses they produced each successive day of the trial. The only explanation for why these rats could have done better than the maze-dull rats is because of the experimenters' biased beliefs. Those students who believed their rats would be able to figure out the maze provided their rats with positive encouragement that eventually helped the rats find their way out with minimal errors. On the other hand, the experimenters who believed their rats would be bad at learning the maze saw no point in encouraging their rats because they believed their rats were never going to be able to learn as quickly as the maze-bright rats. This once again proves how, just as in the above study with the academic bloomers, the simple act of believing in a child can have a severe impact on their psychological intellectual development. Being smarter has positive implications for children both in the short run and in the long run in that it inspires achievement and success, whether that be in school or in a future career. Therefore, if the game theory of childrearing in terms of psychological development is to be implemented in a way that produces the maximum positive result, parents must demonstrate unrelenting belief in their children (Rosenthal et al. (2)).

Parents can create a game theory of child rearing in terms of psychological development by employing tactics associated with the environment in which they raise their children, both in terms of the physical environment and the parenting style used in the environment, and by believing in their children. When this game theory is implemented optimally, it can benefit children both in the short term and in the long term.

Appendix

Table I

MEAN ERROR SCORES FOR BRIGHT AND DULL ANIMALS REARED IN ENRICHED AND NORMAL ENVIRONMENTS

	Enriched environment	Normal environment
Bright	111.2	117.0
Dull	119.7	164.0

Source: Cooper and Zubek

Table II

MEAN ERROR SCORES FOR BRIGHT AND DULL ANIMALS REARED IN RESTRICTED AND NORMAL ENVIRONMENTS

	Restricted environment	Normal environment
Bright	169.7	117.0
Dull	169.5	164.0

Source: Cooper and Zubek

Table III

MEAN GAINS IN IQ

Grade	Controls		Experimentals		Diff.	<i>t</i>	<i>p</i> †
	<i>M</i>	<i>σ</i>	<i>M</i>	<i>σ</i>			
1	12.0	16.6	27.4	12.5	15.4	2.97	.002
2	7.0	10.0	16.5	18.6	9.5	2.28	.02
3	5.0	11.9	5.0	9.3	0.0		
4	2.2	13.4	5.6	11.0	3.4		
5	17.5	13.1	17.4	17.8	-0.1		
6	10.7	10.0	10.0	6.5	-0.7		
Weighted <i>M</i>	8.4*	13.5	12.2**	15.0	3.8	2.15	.02

*Mean number of children per grade = 42.5.

**Mean number of children per grade = 10.8.

†*p* one-tailed.

Source: Rosenthal and Jacobson

Table IV

PERCENTAGES OF EXPERIMENTAL AND CONTROL Ss GAINING 10, 20, OR 30 IQ POINTS (FIRST AND SECOND GRADE CHILDREN)

IQ Gain	Control Ss*	Experimental Ss**	χ^2	p^\dagger
10 points	49	79	4.75	.02
20 points	19	47	5.59	.01
30 points	5	21	3.47	.04

*Total number of children = 95.

**Total number of children = 19.

† p one-tailed.

Source: Rosenthal and Jacobson

Table V

NUMBER OF CORRECT RESPONSES PER S PER DAY

<i>N</i> of Es	1	6	6		
<i>N</i> of Ss	5	30	30		
Day	Asst.	Bright	Dull	<i>t</i>	<i>p</i> (one-tailed)
1	1.20	1.33	0.73	2.54	.03
2	3.00	1.60	1.10	1.02	NS
3	3.80	2.60	2.23	0.29	NS
4	3.40	2.83	1.83	2.28	.05
5	3.60	3.26	1.83	2.37	.03
Mean	3.00	2.32	1.54	4.01	.01

Source: Rosenthal and Kermit

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