Permissive Parenting Style and Maladaptive Behavioral Tendencies Among Junior High School Students of Notre Dame of Tacurong College, Mindanao, Philippines

Danika Cabanatuan, Crizjale Ahmad*

Sultan Kudarat State University, the Philippines
Correspondence: E-mail: crizjaleahmad@sksu.edu.ph

ABSTRACTS

Parenting style is an essential factor in the development of children's behavior. But, it should research oppositely. This study determined the relationship between Permissive Parenting Styles and Maladaptive Behavioral tendencies. This study answer: (1) To what extent is the respondents' permissive parenting style experienced? (2) To what degree do respondents manifest maladaptive behavioral tendencies? and (3) is there a significant correlation between permissive parenting style and maladaptive behavioral tendencies of the respondents? The study revealed that parents were most likely to have an amiable attitude towards their children. The parents allow them to express their feelings, form their perspectives, and create their own decisions. They somehow showed considerations about their child's well-being and did not tolerate some stuff such as absences and laziness. Despite having a permissive parent, children have cheated on school tests, lied about their age to gain entrance, purchase liquor, take a cigarette, or even steal money from their parents or other family members. Using a permissive parenting style does not have a significant relationship with their kids in developing maladaptive behavioral tendencies. It is recommended to look for other factors contributing to maladaptive behavior since permissive parenting does not affect maladaptive behavior and try to venture into other parenting styles.

ARTICLE INFO

Article History:
Received 29 Jun 2021
Revised 01 Aug 2021
Accepted 15 Aug 2021
Available online 17 Aug 2021

Keyword:
Education, Mal-adaptive behavior, Permissive parenting.

© 2021 Universitas Pendidikan Indonesia
1. INTRODUCTION

The essential factor in the development of anxiety disorders in children. Empirically, the association is consistently confirmed but modest, with specific styles like parental control being more critical than parental rejection. Parents not only can serve as powerful models of social behavior for children but also have a unique opportunity to shape their children's behavior over the course of years through parent-child interactions. Although specific parenting behaviors, such as spanking or reading aloud, may influence child development, looking to any particular behavior in isolation may be misleading.

Permissive parenting that permissive parents sometimes referred to as indulgent parents, makes very few demands of their children. These parents rarely discipline their children because they have relatively low expectations of maturity and self-control. In addition, permissive parents "are more responsive than they are demanding. They are nontraditional and lenient, do not require mature behavior, allow considerable self-regulation, and avoid confrontation." Permissive parents are generally nurturing and communicative with their children, often taking on a friend's status more than that of a parent (Power, 2013)

Maladaptive behavior is a series of behaviors by someone who reacts and misbehaves to internal or external stimuli. The term "maladaptive" is formed by prefixing the word "adaptive" with the prefix "mal-", which means "to change, shift, or alter." It's common in discussions about development, education, and evolution, all of which strongly emphasize forward-moving change and meeting new challenges. "Bad" or "ill" is the direct translation of the prefix "mal." Since the psychological constructs surrounding maladaptive behavior do not measure bad or ill behavior, the word "maladaptive behavior" is used to define inadequate adaptation, modification, or adjustment (Pusponegoro et al., 2015).

With the above-stated literature, the researchers aim to conduct a study to determine the relationship between permissive parenting style and the maladaptive behavioral tendency of the junior high school students of Notre Dame of Tacurong College.

1.1. Statement of The Problem

This study aims to determine the relationship between Permissive Parenting Styles and Maladaptive Behavioral tendencies among Grade 10 Junior High School students of Notre Dame of Tacurong College.

Specifically, the study seeks to answer the following problems:
(i) To what extent is the respondents' permissive parenting style experienced?
(ii) To what degree do respondents manifest maladaptive behavioral tendencies?
(iii) Is there a significant correlation between Permissive Parenting Style and Mal-adaptive Behavioral Tendencies?

1.2. Significance of The Study

The results of this study will be beneficial to the following:
(i) To the Parents, the result of this study will help them know more about how their parenting style affects their child's behavior, and thus, they will be more aware of how they will handle their children.
(ii) To the Students, this study will help them recognize and be knowledgeable on how their parents treat them. Thus, they will develop a broader perspective.
(iii) To the Teachers, the result of this study will help them analyze why their students are acting such behaviors in school. This study will also help them to guide and understand their students more.
(iv) To Future Researchers, this study will be helpful as reference material and serve as a guide for their research concerning parenting styles and child’s maladaptive behaviors.

1.3. Scope of The Study

This study focused only on the Permissive Parenting Style and Maladaptive Behavioral Tendencies among grade 10 junior high school students of Notre Dame of Tacurong College. The respondents are selected grade 10 junior high school students.

2. METHODOLOGY

2.1. Research Design

This study used a descriptive-correlational research method to describe the extent of permissive parenting style, the degree of respondents' manifestation of maladaptive behavioral tendencies, and the relationship between permissive parenting style and maladaptive behavioral tendencies of the respondents.

2.2. Locale of The Study

The study was conducted in Notre Dame of Tacurong College - Junior High School Department, Tacurong City, Sultan Kudarat. It is located in the City of Tacurong, Sultan Kudarat, Region XII, Philippines.

2.3. Respondents

The respondents of the study are the Grade 10 Junior High School Students of Notre Dame of Tacurong College. A total of 100 students from the grade 10 junior high school served as the respondents of the study.

2.4. Sampling

The respondents have purposively intended only for Grade 10 Junior High School Students. Convenience sampling was also used since only those who answered the questionnaire online were the respondents. After collecting the desired sample, the researchers used quota sampling for the first 100 respondents who answered the online questionnaire, and those 100 were taken as the respondents of the study.

2.5. Instrumentations

The instrument used in this study was an adapted parental authority survey questionnaire from Buri 1991 to gather necessary data for the permissive parenting style and maladaptive behavioral tendencies among grade 10 junior high school students of Notre Dame of Tacurong Colleges. The questionnaire consists of three parts; Part I of the questionnaire is the profile of the respondents, such as; age and gender. Part II of the survey questionnaire is for the parents' permissive parenting style, how they are treated, and how they are handled. Part III of the questionnaire is the adapted questionnaire from Elliot & Ageton, 1980 on the maladaptive behavioral tendencies of the respondents. Respondents were asked about their self-delinquency report. They were asked to click the response that corresponds to their answer. In the response analysis, the numerical equivalent was used 4 means Always, 3 is Almost always, 2 is Seldom, and 1 is Never.

2.6. Data Gathering Procedure

The researchers asked permission from the Office of the President and Office of the Principal of the High School Department to conduct the study. Upon approval, the researchers
personally contacted the Grade 10 Junior High School advisers to ask them the process of sending the google form link to the respondents. The proper health protocol has been followed upon submission of the approved letter of request. After that, the researchers administered the distribution of the online questionnaire to the respondents and collected the questionnaires after accomplishing it.

2.7. Statistical Treatment

Mean and standard deviation was employed in determining the extent of permissive parenting style experienced by the respondents. Pearson Product-Moment Correlation coefficient was utilized in describing the significant relationship between the permissive parenting style and maladaptive behavioral tendencies of the respondents.

2.8. Data Analysis

Table 1 shows to analyze the permissive parenting style and maladaptive behavior tendencies, the first three highest mean and two lowest mean of items were highlighted for discussions. To further analyze, the permissive parenting style and maladaptive behavioral tendencies.

The first three highest mean and lowest mean of items were highlighted for discussions to analyze the predominant maladaptive behavior tendencies (Table 2).

To analyze the relationship between permissive parenting style and maladaptive behavioral tendencies, the quantitative interpretation of the degree of linear relationship was used using the following range of values (Table 3).

Table 1. Analyze the permissive parenting style and maladaptive behavior tendencies.

| Scale | Range of Mean | Description         |
|-------|---------------|---------------------|
| 4     | 3.50 – 4.00   | To A Great Extent   |
| 3     | 2.50 – 3.49   | To Some Extent      |
| 2     | 1.50 – 2.49   | To A Less Extent    |
| 1     | 1.00 – 1.49   | Not At All          |

Table 2. Analyze the predominant maladaptive behavior tendencies.

| Scale | Range of Mean | Description |
|-------|---------------|-------------|
| 4     | 3.50 – 4.00   | Always      |
| 3     | 2.50 – 3.49   | Often       |
| 2     | 1.50 – 2.49   | Seldom      |
| 1     | 1.00 – 1.49   | Never       |

Table 3. The quantitative interpretation of the degree of linear relationship.

| Range          | Description                                    |
|----------------|-----------------------------------------------|
| ±1.00          | Perfect positive (negative) correlation       |
| ±0.91 - ±0.99  | Very high positive (negative) correlational   |
| ±0.71 - ±0.90  | High positive (negative) correlational        |
| ±0.51 - ±0.70  | Moderately positive (negative) correlational  |
| ±0.31 - ±0.50  | Low positive (negative) correlational         |
| ±0.01 - ±0.30  | Negligible positive (negative) correlations   |
| 0.00           | No correlations                               |
3. RESULTS AND DISCUSSION

3.1. Permissive Parenting Style

The first research problem deals with the extent of the permissive parenting style being experienced by the respondents. **Table 4** presents the findings.

As reflected in **Table 4**, item 15, My parents have an amiable attitude towards me, obtained the highest mean of 3.44 (SD =0.76), and interpreted as To Somewhat Extent. This result indicates that parents of the grade 10 students are amicable in interacting with their children. Their parents don’t show aggressiveness in terms of interacting with their children. Their parents show like a friend to the students rather than being a parental figure.

This coincides, these parents don't expect their children to be mature, and they sometimes seem to be more of a friend than a parent. They would rather be a companion to their child than an authority figure, allowing them to play with various interests and hobbies. Taking a friendly approach to children creates a less rigid atmosphere for them, making it easier to tap into their natural imagination.

However, in item 10, My parents allow me to form my point of view on family matters and they generally allow me to decide for myself what I am going to do, obtained the second-highest mean of 3.21 (SD=0.76) and interpreted as To Somewhat Extent. This result implies that their parents show support and allows their child's decision. They don't show restrictions when it comes to decision-making. They allow their child to explore and generate his/her thoughts and decisions. Support the ideas and views of their child, develops them into an independent child.

This confirms the idea of Cherry stated that permissive parenting causes poor decision-making because the parents do not set or enforce any rules or guidelines. As a result, the child will fail to develop good problem-solving and poor decision-making skills. With this poor decision-making, children won't understand the consequences of their actions in a particular situation. Their child wouldn't also understand that time-outs and losing privileges are logical consequences for poor decision-making.

On the other hand, in item 2, I know what my parents expect of me in my family, but I also feel free to discuss those expectations with my parents when I feel that they are unreasonable, obtained the third highest mean 3.17 (SD=0.85), and interpreted as To Somewhat Extent. This result infers that respondents' parents do not show barriers to expressing emotions and shortcomings within their children. Whenever their expectations are unreasonable, they are free or willing to listen to their child's thoughts and views.

That as a parent that shows a more friendly approach rather than being authoritative, they allow their child to express their feelings when it comes to decision making and when it comes to their abilities. She mentioned that parents who practice a permissive parenting style would be very responsive to their child's emotional needs.

As shown in **Table 5**, item 19, My parents allow me to miss school or either wake up late for school, obtained the lowest mean of 1.71 (SD=0.89), and interpreted it as To A Less Extent. Their parent does not allow laziness in going to school. They are not tolerating absences in school or even waking up late in school.

This applies to the study that parents can be effective partners in avoiding and solving problems. New research backs up this claim, finding that precise, low-cost interventions to change parental attendance beliefs may minimize student absences and pave the way for academic performance. Despite the friendly approach, parents would always want the best for their kids and as an example, tolerating absences and laziness in school shouldn't be a must (Korom & Dozier, 2021).
| Items                                                                 | Mean | SD    | Description        |
|----------------------------------------------------------------------|------|-------|--------------------|
| 1. My parents feel that what children need is to be free to make up  | 2.75 | 0.77  | To Somewhat Extent |
| their minds and to do what they want to do, even if this does not   |      |       |                    |
| agree with what their parents might want                             |      |       |                    |
| 2. I know what my parents expect of me in my family, but I also     | 3.17 | 0.85  | To Somewhat Extent |
| feel free to discuss those expectations with my mother when I feel  |      |       |                    |
| that they are unreasonable.                                          |      |       |                    |
| 3. My parents seldom give me expectations and guidelines for my     | 3.07 | 0.74  | To Somewhat Extent |
| behavior.                                                            |      |       |                    |
| 4. My parents do what I want when making family decisions,         | 2.73 | 0.78  | To Somewhat Extent |
| activities, decisions, and desires as they are growing up           |      |       |                    |
| 5. My parents feel that most problems in society would be solved    | 2.78 | 0.96  | To Somewhat Extent |
| if parents would not restrict their children's                      |      |       |                    |
| 6. My parents allow me to decide most things for myself without a   | 2.62 | 0.83  | To Somewhat Extent |
| lot of direction from them.                                          |      |       |                    |
| 7. My parents consider my opinions when making family decisions,   | 3.16 | 0.86  | To Somewhat Extent |
| but they will not decide something simply because I want it.        |      |       |                    |
| 8. My parents do not view themselves as responsible for directing   | 2.28 | 0.93  | To A Less Extent  |
| and guiding my behavior.                                            |      |       |                    |
| 9. My parents have clear standards of behavior, but they are to     | 3.16 | 0.70  | To Somewhat Extent |
| adjust those standards to my needs.                                 |      |       |                    |
| 10. My parents allow me to form my point of view on family matters  | 3.21 | 0.76  | To Somewhat Extent |
| and they generally allow me to decide for myself what I am going to |      |       |                    |
| do.                                                                 |      |       |                    |
| 11. My parents often tell me exactly what she wants me to do and   | 3.01 | 0.76  | To Somewhat Extent |
| how she expects me to do it.                                        |      |       |                    |
| 12. My parents do not direct my behavior, activities, and desires.  | 2.55 | 0.88  | To Somewhat Extent |
| 13. If my parents make a decision in the family that hurts me,    | 2.90 | 0.96  | To Somewhat Extent |
| they are willing to discuss that decision with me and admit if they |      |       |                    |
| make a mistake.                                                     |      |       |                    |
| 14. My parents don't follow any order or schedule.                  | 2.08 | 0.97  | To A Less Extent  |
| 15. My parents have a very friendly attitude towards me.            | 3.44 | 0.76  | To Somewhat Extent |
| 16. My parents agree to whatever I say or demand.                   | 2.37 | 0.77  | To A Less Extent  |
| 17. My parents are very responsive to my emotional needs.           | 2.89 | 0.86  | To Somewhat Extent |
| 18. My parents place very little responsibility, such as            | 2.87 | 0.97  | To Somewhat Extent |
| 19. My parents allows me to miss school or either wakes             | 1.71 | 0.89  | To A Less Extent  |
| 20. My parents are monitoring my study habits.                      | 3.07 | 0.71  | To Somewhat Extent |
| Overall Mean and SD                                                 | 2.79 | 0.43  | To Somewhat Extent |

On the other hand, item 14, parents don't follow any order or schedule, obtained the second-lowest mean of 2.08 (SD=0.97) and interpreted as To A Less Extent. This implies that the respondents' parents are still setting some orders and schedules but not strictly as possible.
This conforms to the study of Selin & Selin, (2014) with the use of orders and schedules, children can effectively complete planned tasks and events without instructions, cues, or alerts when routines are consistent. This boosts children’s self-esteem and trust. Routines, orders, and schedules help the child learn, survive, and develop by providing a consistent atmosphere where we can all understand, thrive, and grow. This can be used as a future vision, preparation, and previewing to keep you out of "damage control."

Generally, the extent of permissive parenting style posted an overall mean of 2.79 (SD=0.43) and was interpreted as To Somewhat Extent. This means there are times that the respondents' parents somewhat show strict parenting but also show a friendly approach to them. They don't tolerate things that can harm their child, and at the same time, they allow their child to explore and made decisions that would help them be an independent child.

3.2. Mal-adaptive Behavioral Tendencies

The second research problem deals with the degree of the respondents' manifestation of maladaptive behavioral tendencies. Table 5 presents the results. As reflected in Table 6, item 17, Cheated on a school test, obtained the highest mean 2.18 (SD=0.76) and was interpreted as Seldom. This result implies that respondents are cheating in their exams. They find cheating is easier than studying their lessons before their exams. This conforms to the study of Korom & Dozier, (2021) that children of permissive parents perform poorly in school because their parents never supervise them and neglect their bad conduct. They are usually spoilt during their upbringing.

However, item 9, Lied about your age to gain entrance or to purchase something: for example, lying about your age to buy liquor or to get into a movie, obtained the second-highest mean 1.72 (SD=0.81) and interpreted as Seldom. This implies that students tried to lie about their ages just to pursue their wants or to get what they want. On the other hand, item 19, Stolen money or other things from your parents or other members of your family, obtained the third highest mean of 1.54 (SD=0.61) and was interpreted as Seldom. This shows that because of their parent's amiable attitude towards them and by giving them the free will on decision-making, respondents tried to steal money and other things from their parents or other family members, thinking they can get benefits in such.

As reflected in Table 6, item 13, Been paid for having sexual relations with someone, obtained the lowest mean 1.00 (SD=0.00) and was interpreted as Never. This implies that respondents never experienced having sexual relations with someone. Hence, in item 14, Had sexual intercourse with a person of the opposite sex, obtained the second-lowest mean 1.00 (SD=0.00), and was interpreted as Never. This implies that respondents never experienced sexual intercourse with a person of the opposite sex. Generally, the degree of respondents' manifestation of Maladaptive Behavioral Tendencies posted an overall mean of 1.23 (SD=0.26) and was interpreted as Never. This implies that respondents do not manifest any maladaptive behavior despite their parents being permissive and not so strict.

3.3 Relationship Between Permissive Parenting Styles and Mal-adaptive Behavioral Tendencies

The third research problem deals with the relationship between permissive parenting styles and maladaptive behavioral tendencies. Table 6 presents the findings.
Table 5. Degree of the respondents' manifestation of maladaptive behavioral tendencies.

| Items                                                                 | Mean | SD  | Description |
|-----------------------------------------------------------------------|------|-----|-------------|
| 1. Purposely damaged or destroyed property belonging to your parents or other family members. | 1.40 | 0.64 | Never       |
| 2. Purposely damaged or destroyed property belonging to a school.     | 1.26 | 0.56 | Never       |
| 3. Purposely damaged or destroyed other property that did not belong to you (not counting family or school property). | 1.36 | 0.63 | Never       |
| 4. Stolen (or tried to steal) a motor vehicle, such as a car or motorcycle. | 1.05 | 0.26 | Never       |
| 5. Stolen (or tried to steal) something worth more than P100-P500.     | 1.24 | 0.47 | Never       |
| 6. Knowingly bought, sold, or held stolen goods (or tried to do any of these things). | 1.16 | 0.44 | Never       |
| 7. Thrown objects (such as rocks, snowballs, or bottles) at cars or people. | 1.28 | 0.3  | Never       |
| 8. Run away from home                                                | 1.21 | 0.48 | Never       |
| 9. Lied about your age to gain entrance or to purchase something: for example, lying about your age to buy liquor or to get into a movie. | 1.72 | 0.81 | Seldom      |
| 10. Carried a hidden weapon other than a plain pocketknife            | 1.13 | 0.46 | Never       |
| 11. Stolen (or tried to steal) things worth P50 or less.              | 1.56 | 0.72 | Seldom      |
| 12. Attacked someone with the idea of seriously hurting or killing him/her. | 1.10 | 0.33 | Never       |
| 13. Been paid for having sexual relations with someone.               | 1.00 | 0.00 | Never       |
| 14. Had sexual intercourse with a person of the opposite sex other than your wife/husband | 1.00 | 0.00 | Never       |
| 15. Been involved in gang fights.                                     | 1.12 | 0.46 | Never       |
| 16. Sold marijuana or hashish ("pot," "grass," "hash").             | 1.04 | 0.32 | Never       |
| 17. Cheated on school tests                                           | 2.18 | 0.76 | Seldom      |
| 18. Hitchhiked where it was illegal to do so.                         | 1.09 | 0.40 | Never       |
| 19. Stolen money or other things from your parents or other members of your Family | 1.54 | 0.61 | Seldom      |
| 20. Hit (or threatened to hit) a teacher or other adult at school.    | 1.06 | 0.37 | Never       |
| 21. Hit (or threatened to hit) one of your parents.                   | 1.06 | 0.28 | Never       |
| 22. Hit (or threatened to hit) other students.                        | 1.38 | 0.58 | Never       |
| 23. Been loud, rowdy, or unruly in a public place (disorderly conduct). | 1.44 | 0.64 | Never       |
| 24. Sold hard drugs, such as heroin, cocaine, and LSD.               | 1.02 | 0.20 | Never       |
| 25. Taken a vehicle for a ride (drive) without the owner's permission. | 1.08 | 0.37 | Never       |
| 26. Bought or provided liquor for a minor.                           | 1.26 | 0.65 | Never       |
| 27. Had (or tried to have) sexual relations with someone against their will. | 1.02 | 0.14 | Never       |
| 28. Used force (strong-arm methods) to get money or things from other students. | 1.03 | 0.22 | Never       |
| 29. Used force (strong-arm methods) to get money or things from a teacher or other adult at school. | 1.07 | 1.38 | Never       |
| 30. Used force (strong-arm methods) to get money or things from other people (not students or teachers). | 1.01 | 1.10 | Never       |
| Overall Mean and SD                                                  | 1.23 | 1.19 | Never       |

Table 6 shows no significant relationship between Permissive Parenting Style and Maladaptive Behavioral Tendencies with a p-value = 1.980 (t_r = .99). As reflected, it shows that Permissive Parenting Style has a Negligible Positive Correlation (r =0.10) to Maladaptive Behavioral Tendencies of Grade 10 Junior High School Students.
Table 6. Relationship between permissive parenting styles and maladaptive behavioral tendencies.

| Permissive Parenting Style | r     | Description       | P-value | t     | Interpretation     |
|----------------------------|-------|------------------|---------|-------|--------------------|
|                             | 0.10  | Negligible Positive | 1.980   | .99   | Not Significant Correlation |
| Maladaptive Behavioral Tendencies |       |                   |         |       |                    |

At .05 level of significance, P < 1.980

This simply implies that the permissive parenting style has nothing to do with the maladaptive behavioral tendencies of the respondents. This result contrasts that children with permissive parents would less likely to experience behavior problems. They might also have fewer emotional problems. Concerning the study of Garcia, (2018) states that children with permissive parents had higher self-esteem. They were less likely to view the world as a hostile, threatening place and less likely to be emotionally withdrawn. They were even less likely to be failing in school. The most well-adjusted children do not have parents who micromanage behavior or claim control by threatening discipline or revoking privileges. That doesn't imply that "parental strictness" creates issues with behavioral problems. Causation may also act in the opposite direction. Children experience behavioral problems, and their parents respond by enforcing stricter discipline.

4. CONCLUSION

Based on the study’s findings, it is concluded that the respondents’ parents were most likely to have a friendly attitude towards them. Though respondents knew of their parents' expectations, they are free to discuss things when they feel unreasonable. Findings also showed that the respondents’ parents allow them to express their feelings, form their point of view, and create their own decisions. They somehow showed considerations about their child’s well-being and did not tolerate some stuff such as absences and laziness when it comes to school. In spite having permissive parent, the study revealed that respondents have cheated on school tests, lied about your age to gain entrance or purchase liquor or cigarette or even stolen money or other things from your parents or other members of your family. However, parents using a permissive parenting style do not have a significant relationship with their kids developing maladaptive behavioral tendencies, as the research results revealed. Therefore, it is recommended that future researchers look for other factors contributing to maladaptive behavior since permissive parenting doesn't affect maladaptive behavior and try to venture into other parenting styles.

5. AUTHORS’ NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

6. REFERENCES

Korom, M., and Dozier, M. (2021). The importance of responsive parenting for vulnerable infants. Advances in Child Development and Behavior, 61(2021), 43–71.

DOI: [http://dx.doi.org/10.17509/xxxx.vxix](http://dx.doi.org/10.17509/xxxx.vxix)
P- ISSN 2775-6793 E- ISSN 2775-6815
Power, T. G. (2013). Parenting dimensions and styles: a brief history and recommendations for future research. *Childhood Obesity, 9*(s1), S-14.

Pusponegoro, H. D., Ismael, S., Sastroasmoro, S., Firmansyah, A., and Vandenplas, Y. (2015). Maladaptive behavior and gastrointestinal disorders in children with autism spectrum disorder. *Pediatric Gastroenterology, Hepatology, and Nutrition, 18*(4), 230-237.

Selin, H., and Selin, H. (2014). Parenting across cultures_ childrearing, motherhood and fatherhood in non-western cultures. *Science Across Cultures: The History of Non-Western Science, 7*(XXII), 516.