

Research Paper

## The Influence of Family Attachment, Academic Stress, and Loneliness on Emotional Eating Patterns Among Asian Youth in Singapore

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### ABSTRACT

The practice of using food as a coping mechanism to deal with challenging emotions like stress is referred to as Emotional Eating. This study explored how family dynamics, academic pressure, and loneliness affect emotional eating behaviors in Indian and Chinese youth living in Singapore, where loneliness and academic stress showed stronger associations, while stronger family attachment seemed to reduce these behaviors. The study examined cultural factors unique to Indian and Chinese adolescents. Findings revealed a notable interaction effect between ethnicity and the RM factor concerning emotional eating, although ethnicity itself was not significant. A notable interaction was observed between loneliness and ethnicity. Strong positive correlations were identified among student stress, family attachment, and loneliness, but not with emotional eating.

**Keywords:** *Emotional Eating, Stress Eating, Academic Stress, Family Attachment, Loneliness, Student Stress*

Emotional eating is the act of eating in reaction to emotions rather than physical hunger (Reichenberger, 2020). Emotional eating and physical hunger are two very distinct things. Physical hunger develops gradually, can be delayed, allows for various food choices, ends when satisfaction is achieved, and does not induce negative emotions. On the other hand, emotional hunger often emerges abruptly, feels urgent and demands instant gratification, leads to cravings for specific foods, remains unfulfilled even after eating, and can evoke emotions like guilt, powerlessness, and shame. Research indicates that 75% of overeating usually comes from emotional triggers, and food cannot satisfy emotional hunger (May, 2005). When individuals continue to engage in emotional eating, they often find themselves trapped in a cycle that prevents them from understanding their feelings. This emotional eating cycle begins with an upsetting event, followed by feeling overwhelmed and the urge to eat, then consuming more food than usual, and ultimately feeling guilty and out of control. Common triggers include stress, boredom, childhood patterns, and social pressures, making it prevalent among adolescents. This topic is important as it is a common problem that impacts many individuals, adversely influencing their physical and mental well-being (Wayback Machine, 2022). Emotional eating can be

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linked to various health problems, such as diabetes, obesity, depression, eating disorders, and heart disease (Wozniak & Huang, 2024; Nazzal, 2018).

Familial pressure can contribute to emotional eating, as adolescents in stressful or conflict-prone family environments may turn to food as comfort or as a means to cope (Chen et al., 2025). This implies that emotional eating may serve as a way to cope with negative feelings that may arise from family dynamics, and it might also act as an escape. Moreover, teenagers are increasingly experiencing loneliness as a result of various factors, such as social media, which distorts reality and make them feel inadequate, and bullying which undermines their self-worth and makes them feel alone or isolated (*The Causes and Impacts of Loneliness in Adolescents*, 2024d). Familial factors such as conflict, neglect, or a lack of emotional support can cause adolescents to experience loneliness. Anxiety, depression, and low self-esteem are just a few mental health issues that result from loneliness (MSEd, 2023b). It can also significantly impact academic performance (Bek, 2017), as they may fail to concentrate in class or seek help when necessary.

### ***Emotional Eating:***

Emotional eating, commonly known as stress eating (Bjørklund et al., 2018), involves consuming food as a way to improve your mood and satisfy emotional cravings instead of hunger. This type of eating is typically unrelated to genuine hunger and is more related to hedonic hunger, when food is consumed solely for pleasure. Many people resort to emotional eating to hide specific feelings tied to significant life changes or the pressures of daily life. Emotional eating affects all sorts of people but is most common in adolescents as they experience great amounts of academic stress and this negatively affects their mental health which leads to certain eating habits or even emotional eating (Caso et al., 2020).

According to psychosomatic theory, emotional eating can be a temporary coping mechanism used by individuals to escape and avoid negative emotions. As a consequence, emotional eating is associated with behaviors like binge eating disorder, which can increase the likelihood of obesity. Studies show that individuals experiencing higher stress levels tend to choose unhealthy foods, like fast food, and consume fewer fruits and vegetables. According to Hedley et al. (2004), more than 30% of children and adolescents are at risk of being overweight.

Additionally, it has been researched that living abroad can influence emotional eating behaviours in adolescents through things like stress and maybe even cultural adaptation. Research highlights that emotional eating is often connected to triggers like homesickness and feelings of isolation (Reichenberger, 2020). Due to this, adolescents may turn to food as a way to manage unpleasant feelings triggered by unfamiliar environments. For those who struggle with social anxiety, food often becomes comfort for them, so this can lead to patterns of emotional overeating. Therefore, adolescents who struggle to form new friendships are likely to engage in emotional eating due to the lack of support which can lead them to feel unsupported which can further influence emotions. Studies show that friendships are crucial for emotional developments and disruptions can push adolescents to follow unhealthy eating habits as a way to fill the void and without any guidance from family members they may lack the support needed to develop healthy coping mechanisms (Bagherniya, 2018).

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### ***Family attachment:***

The concept of family attachment refers to the nature of the relationship between a child and their parents, which strives to ensure a child's safety, security, and protection. The purpose of attachment is for the child to feel safe, secure, and protected. Attachment differs from bonding; bonding is an unconditional love shown by adults towards children, while attachment describes a child's conditional response based on their perception of safety in their environment and the caregiver's reliability. Thus, attachment represents the connection a child forms with an adult or a caregiver. A famous theory by John Bowlby and Mary Ainsworth examined how early relationships between caregivers and children influence emotional development and create attachment styles that can persist into adulthood (Bowlby, 1969; Ainsworth, 1978).

Children with a secure attachment feel safe and confident that their caregivers will meet their needs. However, when the caregivers are emotionally distant or reject them, children feel a type of insecure-avoidant attachment. Additionally, when caregivers are inconsistent in their responses, children may become anxious and worried that their needs will not be met (Ainsworth et al., 1978). Lastly, disorganised attachment often emerges when children experience fear due to caregivers being abusive (Shemmings & Shemmings, 2011). So, children with a secure attachment style tend to develop healthy emotion regulation strategies. In contrast, insecurely attached individuals may have difficulty regulating their emotions as the child might not learn and understand how to effectively manage negative emotions and which may lead to emotional eating (Bost et al, 2013). The experience of being far away from family can increase emotional vulnerabilities and influence and influence coping behaviours such as emotional eating (Sominsky et al., 2014). Individuals with an anxious attachment style may experience an increase in stress and due to this may use food as a way to manage their anxiety and feelings. Furthermore, those with avoidant attachment styles may struggle with expressing their emotions which can lead them to suppress their feelings and therefore engage in emotional eating (Bost et al, 2013).

### ***Academic Pressure***

Academic pressure can be described as the feeling of stress and anxiety that most adolescents experience during their academic life. While academic pressure can vary between students, for some, it serves as a source of motivation, driving them to work hard to achieve their goals, but for others it can also be crushing. Teenagers frequently struggle with problems including anxiety, depression, and eating disorders, with academics being a significant contributor to these challenges. One of the primary causes of stress in adolescents is academic pressure, but stress in the short term causes a decrease in appetite. However, extended periods of stress can elevate cortisol levels, which may result in an increase in appetite for junk foods. Based on the academic stress theory, academic stress arises from poor study resources, teacher-student relationships and the fear of failure (Phillips et al., 2020). According to the Individual Differences Model, which was first introduced by Greeno & Wing (1994) states that stress is a major contributing factor to poor eating habits.

Studies have indicated that one of the major causes of emotional eating in adolescents is academic stress. This is because the pressure to perform well academically can lead to an increase in stress levels which adolescents often cope with through emotional eating (Lien et al., 2002). Additionally, emotional eating is more common among adolescents who experience high amounts of academic stress. Typically, this behavior involves consuming high-calorie and unhealthy foods in response to stress (hedonic hunger) as opposed to

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physical hunger which can lead to unhealthy eating patterns (Epel et al., 2001). Academic pressure also varies between genders, research has shown that female adolescents may be more susceptible to emotional eating in response to academic stress compared to male adolescents, this could be due to differences in coping mechanisms and social expectations. Students may also use food as a reward for completing certain tasks that may be hard or stressing such as exams, this can create a pattern where eating becomes associated with positive reinforcement which can lead to constant emotional eating (Robinson et al., 2014). Lastly, academic pressure can impact self-esteem, particularly if students feel like they don't fit in. This can lead to emotional eating as a way to seek relief from negative perceptions (Puhl & Latner, 2007).

Adolescents who study abroad would experience difficulties in progressing academically as for example Korean students who moved abroad to the US felt as if the academic pressure was hard to bear, there was a lot of school work, which made them feel very stressed (Choi et al., 2019). Language barriers may be one of the biggest factors in academic pressure to those living abroad as learning a new language takes a lot of time especially to become comfortable with it (Wang & Keller, 2014). Additionally, these kids had an increase in academic pressure due to their parent's expectations for success and feelings of guilt for not meeting these expectations. Being far away from home can also lead to feelings of loneliness which can further increase stress levels. Once again these are all contributing factors to emotional eating (Epel et al., 2001).

### ***Loneliness***

Loneliness is a state of mind linked to craving human interaction but this mindset makes it difficult for the individual to form connections with others. There are four categories of loneliness: emotional, social, situational, and chronic. Emotional loneliness is the absence of meaningful relationships, for many people this feels like being alone with just thoughts, feelings, without a source of comforting closeness (Weiss, 1975). The term "social loneliness" describes the lack of social connections or having few people to interact with regularly (Weiss, 1975). Situational loneliness refers to the feelings of loneliness that arise due to specific circumstances or changes in one's environment. It is usually temporary (Cae, 2024). Lastly, chronic loneliness is a long-lasting feeling of loneliness that persists over time, it can be linked to various factors such as social anxiety, mental health issues, social isolation, and lack of meaningful relationships (Meeks et al., 2007b). Loneliness can result from insecure attachment patterns, and this can lead to individuals feeling less confident in forming relationships due to past experiences (Bartholomew & Horowitz, 1991).

Research indicates that in late adolescence, loneliness peaks, then progressively declines throughout middle adulthood before rising in late adulthood (Luhmann & Hawkey, 2016). Loneliness has been linked to many negative mental health outcomes such as depression, poor sleep quality, psychological changes, and even eating disorders/emotional eating (Victor & Yang, 2011). Loneliness is closely linked to emotional eating, individuals often turn to food as a way to cope with feelings of isolation. Loneliness can trigger emotional eating by increasing feelings of stress and depression which are common triggers for emotional eating.

Adolescents studying in foreign countries away from their family and friends are especially at risk of experiencing loneliness. Although studying abroad may have certain benefits such as the opportunity to meet new people, develop their connections, pick up a new language,

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and develop their identity, it can also be a new set of challenges such as substantial changes in their home environment, their peers, and their school (Serrano-Sánchez, 2021). These adjustments have been correlated with negative psychological effects such as stress and even unfulfilling social relationships which in turn have been linked to loneliness (Demes & Geeraert, 2015). Adolescence is a multifaceted phase of development that is influenced by several factors, including geographical and family environment. During this time, individuals experience biological, psychological, and social changes that create a divide between the adolescent and adult stages of life. The desire for increased independence and autonomy during adolescence often leads adolescents to isolate themselves and distance themselves from their families while still not being fully integrated with their peers (Goossens, 2018). This can also lead to feelings of loneliness which can trigger other emotions like stress and depression, which are again the key factors contributing to emotional eating.

This research aims to investigate how different factors, such as family attachment, academic pressure, and feelings of loneliness, affect emotional eating, particularly among Indian and Chinese youth living in Singapore. Indian and Chinese adolescents were particularly taken under consideration as they might be living away from home, and only living in Singapore for their studies and a better future. Additionally, the family structure for both Indian and Chinese emphasizes greatly on academic excellence. Lastly, the body image perception in both countries is rather strict, with common instances of body shaming for example (Ganesan et al., 2018b; Kakar et al., 2023).

### METHODOLOGY

#### *Aim*

The aim of this study is to explore the relationship between loneliness, student stress, family attachment, and emotional eating, particularly its prevalence in Indian and Chinese adolescents living in Singapore.

#### *Objectives*

- To investigate the relationship between emotional eating patterns and family attachment styles among Indian and Chinese adolescents residing in Singapore.
- To analyze the effects of academic pressure on emotional eating habits in Indian and Chinese adolescents, explore the role of parental expectations, peer competition, and self-perceived academic performance on emotional eating behaviors.
- To compare emotional eating habits across gender and ethnicity, evaluate gender specific differences and similarities in stress eating behaviors among Indian and Chinese adolescents.

This study explores how family attachment influences emotional eating by comparing eating patterns in family-oriented environments versus independent settings. By focusing on ethnicity and age, the study examines how familial support and dynamics affect emotional eating behaviors.

#### *Hypothesis:*

- **H1:** There will be a significant difference between gender groups with respect to the dependent variable of:
  - Student Stress scores

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- Emotional eating
- Family attachment
- Loneliness
- **H2:** There is a significant impact of age on the relationship between student stress scores and emotional eating scores.
- **H3:** The relationship between family attachment and emotional eating scores is significantly impacted by age.
- **H4:** There is a significant effect of age on the relationship between loneliness and emotional eating scores
- **H5:** The relationship between student stress and emotional eating is significantly impacted by ethnicity.
- **H6:** There is a significant effect of ethnicity on the relationship between family attachment and emotional eating scores
- **H7:** There is a significant effect of ethnicity on the relationship between loneliness and emotional eating scores
- **H8:** There will be a strong correlation between Student Stress, Emotional Eating, Family attachment, and Loneliness.

### *Sample and sampling technique*

The present study was conducted of 25 Chinese adolescents living in Singapore aged 15-18, and 25 Indian adolescents living in Singapore aged 15-18 and utilised a convenience sampling technique.

### *Instrumentation*

Family attachment and changeability index (Fischer, Corcoran and Kevin, 2007): The questionnaire consists of 16 items, 8 measuring attachment and 8 measuring changeability. All the items on the attachment subscale have to be reversed. They are on a Likert scale of 1 to 5 with 1 being never and 5 being always.

UCLA loneliness scale (Russel, Peplau and Ferguson, 1978): The questionnaire is made up of 20 items that are designed to assess an individual's subjective feelings of loneliness and experiences of social isolation. Each item is rated as one of the following; I often feel this way, I sometimes feel this way, I rarely feel this way, and I never feel this way.

Salzburg Stress Eating Scale (SSES; Meule, Reichenberger, & Blechert, 2018). This scale consists of 10 items measuring stress eating. They are again on a Likert scale of 1 to 5 with 1 being I eat much less than usual and 5 being I eat much more than usual.

Student Stress Inventory (SSI) (Arip & Shah, 2018). This scale was developed to assess stress levels among university students through 40 items, 10 measuring physical, 10 measuring interpersonal relationships, 10 measuring academic, and 10 measuring environmental factors. The scale is measured from 1 to 4, with 1 being never and 4 being always.

### *Data collection procedure*

The data was collected from school students in Singapore, by utilising a Google Form. The standardised questionnaires were compiled together and circulated among students of different grades and the survey includes an introduction that outlines the purpose of the

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study and guarantees participants' confidentiality. The survey will target individuals particularly Indian and Chinese adolescents residing in Singapore.

### *Ethical considerations*

Prior to participating in the survey, participants received an introduction outlining the nature of their participation and the purpose of the research. They were informed that their involvement is completely voluntary and that they may withdraw at any time whenever they wish for any reason without any consequences. To ensure confidentiality of respondents, no personal information was collected. They were assured that their individual responses will not be shared or published in any form. The survey provided clear instructions on how to fill out the questionnaire.

## **RESULTS**

*Table 1 shows the t-test values for Gender and Student Stress*

		n	M	SD	t	df	p	Cohen's d
<b>Student Stress</b>	Female	36	51.19	10.65	-0.06	43	.953	0.02
	Male	9	51.44	13.89				

Table 1 revealed that there is no significant mean difference on student stress across gender with  $t=-0.06$ ,  $p=0.953$  ( $p>0.05$ ). The value of Cohen's d was 0.02 which indicated a very small effect size. As a result, H1(a) stating that there will be a significant difference between gender and student stress scores is rejected.

*Table 2 shows the t-test value for Gender and Emotional Eating*

		n	M	SD	t	df	p	Cohen's d
<b>Emotional Eating</b>	Female	36	28.58	7.96	-0.5	43	.618	0.19
	Male	9	30	5.52				

Table 2 showed that, with  $t=-0.5$ ,  $p=0.618$  ( $p>0.05$ ), there is no significant mean difference on emotional eating across gender. A small effect size was indicated by the value of Cohen's d was 0.19 which indicated a small effect size. As a result, H1 (b) which claims that there will be a significant difference between gender and emotional eating is rejected.

*Table 3 shows the t-test values for Gender and Family attachment*

		n	M	SD	t	df	p	Cohen's d
<b>Family attachment</b>	Female	36	60.5	11.91	0.04	43	.969	0.01
	Male	9	60.33	9.94				

Table 3 revealed that there is no significant mean difference on family attachment across gender with  $t=0.04$ ,  $p=0.969$  ( $p>0.05$ ). The value of Cohen's d was 0.01 which indicated a very small effect size. Thus, H1 (c) stating that there will be a significant difference between gender and family attachment will be rejected.

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Table 4 shows the t-test values for Gender and loneliness

		n	M	SD	t	df	p	Cohen's d
Loneliness	Female	36	19.75	15.95	-0.12	43	.906	0.04
	Male	9	20.44	14.83				

Table 4 revealed that there is no significant mean difference on loneliness across gender with  $t=-0.12$ ,  $p=0.906$  ( $p>0.05$ ). The value of Cohen's d was 0.04 which indicated a very small effect size. Thus, H1 (d) stating that there will be a significant difference between gender and loneliness is rejected.

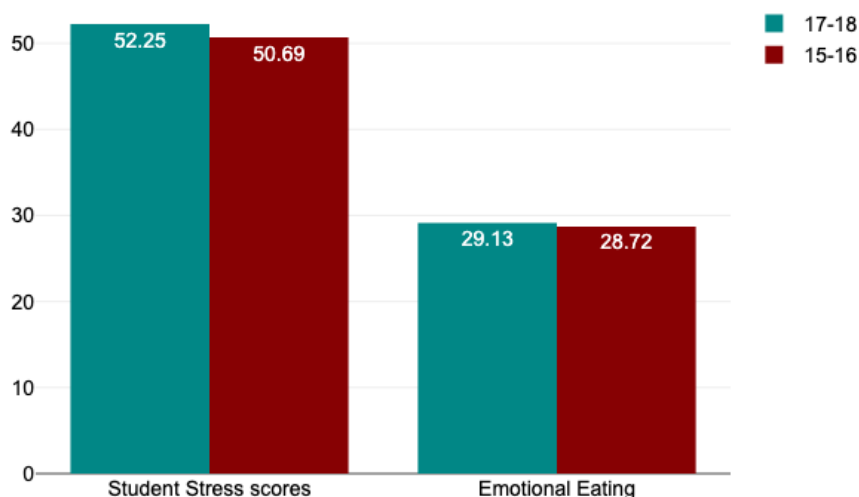


Figure 1 shows the mean age of respondents on emotional eating and student stress

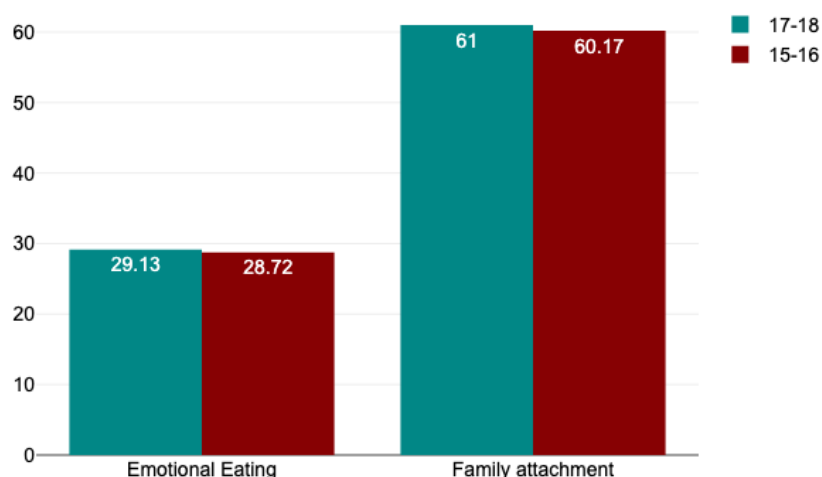
Table 5 shows the ANOVA values for student stress and emotional eating across age

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
Student Stress scores, Emotional Eating scores	11267.21	1	11267.21	129.91	<.001	0.58
Age	19.83	1	19.83	0.2	.656	0
RM Factor x Age	6.93	1	6.93	0.08	.779	0
Residuals (Between Subjects)	4237.39	43	98.54			
Residuals (Within Subjects)	3729.36	43	86.73			

Table 5 presents the results of ANOVA which investigates how student stress scores affect emotional eating scores along with age interaction effects. Student stress scores showed a substantial main effect  $F=129.91$ ,  $p<0.001$ ,  $\eta^2=0.58$ , demonstrating that emotional eating behavior was heavily affected by student stress with a large effect size. However, the statistical analysis showed no significant interaction effect with  $F=0.2$ ,  $p=0.656$ , and also found no significant interaction effect between repeated measures (RM) Factor x Age,  $F=0.08$ ,  $p=0.779$ . The effect size for both main and interaction effects of age was negligible ( $\eta^2=0$ ), suggesting that age did not have an independent effect on emotional eating scores nor did it interact with the RM factor to influence the outcomes. This implies that the relationship between stress and emotional eating is consistent across different age groups,

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with no significant moderation effect due to age. Thus, H2 which predicted notable age differences in student stress and emotional eating patterns was not supported.



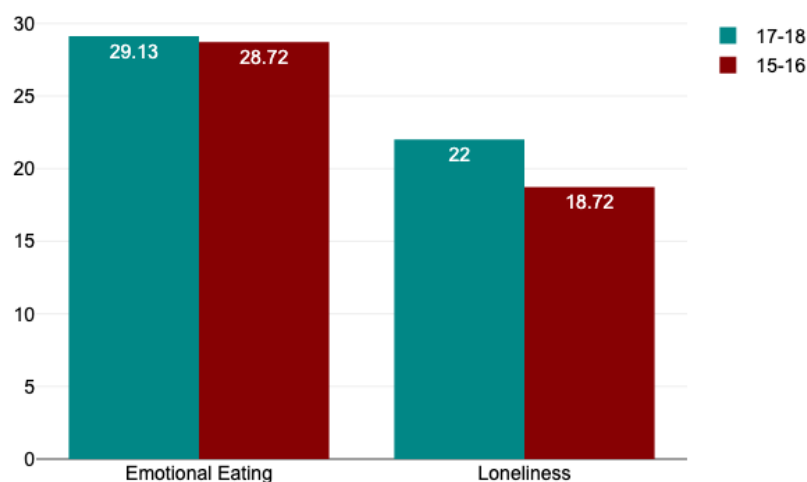
*Figure 2 shows the mean age of respondents on emotional eating and family attachment scale*

*Table 6 shows the ANOVA values for family attachment and emotional eating across age*

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
<b>Emotional Eating, Family attachment</b>	22467.6	1	22467.6	263.07	<.001	0.73
<b>Age</b>	7.78	1	7.78	0.07	.788	0
<b>RM Factor x Age</b>	0.94	1	0.94	0.01	.917	0
<b>Residuals (Between Subjects)</b>	4549.22	43	105.8			
<b>Residuals (Within Subjects)</b>	3672.46	43	85.41			

Table 6 presents the results of ANOVA by examining the effects of emotional eating and family attachment, along with the interaction effect of age. A significant main effect was found for emotional eating and family attachment,  $F=263.07$ ,  $p<0.001$ ,  $\eta^2=0.73$ , indicating that emotional eating significantly influenced emotional eating behavior, with a large effect size. However, the main effect of age,  $F=0.07$ ,  $p=0.788$ , and the interaction effect of repeated measure (RM) Factor x Age,  $F=0.01$ ,  $p=0.917$ , were not significant. Both effects showed negligible effect size  $\eta^2=0$ , suggesting that age did not have an independent effect on emotional eating behaviors nor did it interact with the RM factor to influence the 4 outcomes. This implies that the relationship between emotional eating and family attachment is consistent across different age groups, with no significant moderation effect due to age. Thus, H3 stating that there will be a significant difference between family attachment and emotional eating across age is rejected.

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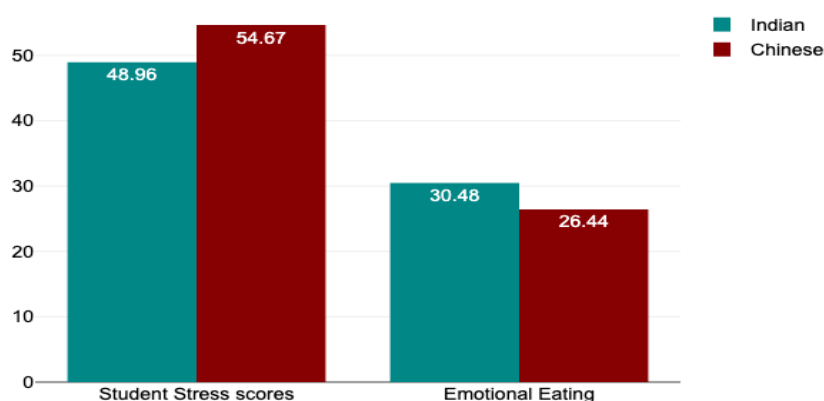


*Figure 3 shows the mean age of respondents on emotional eating and loneliness scale*

*Table 7 shows the ANOVA values for loneliness and emotional eating across age*

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
<b>Emotional Eating, Loneliness</b>	1813.51	1	1813.51	14.38	<.001	0.12
<b>Age</b>	69.69	1	69.69	0.39	.534	0
<b>RM Factor x Age</b>	42.61	1	42.61	0.34	.564	0
<b>Residuals (Between Subjects)</b>	7613.46	43	177.06			
<b>Residuals (Within Subjects)</b>	5421.88	43	126.09			

Table 7 represents the results of ANOVA by examining the effects of emotional eating and loneliness, along with the interaction effect of age. A significant main effect was found for emotional eating and loneliness,  $F=14.38$ ,  $p<0.001$ ,  $\eta^2=0.12$ , indicating that loneliness significantly influenced emotional eating behavior, with a moderate effect size. However, the main effect of age,  $F=0.39$ ,  $p=0.534$ , and the interaction effect of repeated measure (RM) Factor x Age,  $F=0.34$ ,  $p=0.564$ , were not significant. Both effects showed negligible effect size  $\eta^2=0$ , suggesting that age did not have an independent effect on emotional eating nor did it interact with the RM factor to influence the outcomes. This implies that the relationship between loneliness and emotional eating is consistent across different age groups, with no significant moderation effect due to age. Thus, H4, stating that there will be a significant difference between loneliness and emotional eating across age is rejected.



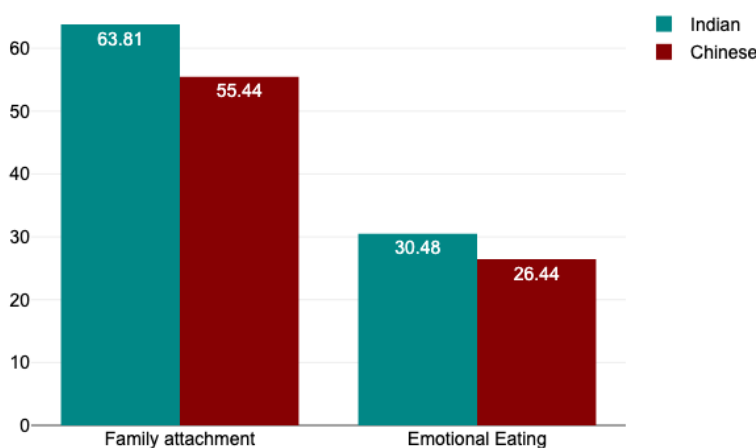
*Figure 4 shows the ethnicity of respondents on student stress and emotional eating*

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*Table 8 shows the ANOVA values for student stress on emotional eating across ethnicity*

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
<b>Student Stress scores, Emotional Eating scores</b>	11267.21	1	11267.21	150.28	<.001	0.58
<b>Age</b>	15	1	15	0.15	.699	0
<b>RM Factor x Age</b>	512.36	1	512.36	6.83	.012	0.03
<b>Residuals (Between Subjects)</b>	4242.22	43	98.66			
<b>Residuals (Within Subjects)</b>	3223.93	43	74.98			

Table 8 represents the results of ANOVA examining the effect of student stress score on emotional eating score as well as the main effect of ethnicity and its interaction with the repeated measures factor (RM). For student stress scores  $F=150.28$ ,  $p<0.001$ ,  $\eta^2=0.58$ , a significant main effect was discovered, indicating that student stress significantly influenced emotional eating behavior, with a large effect size. However, the main effect of ethnicity  $F=0.15$ ,  $p=0.699$  was not significant and showed a negligible effect size of  $\eta^2=0$ . This indicates that ethnicity alone does not influence emotional eating scores. However, the interaction effect between the RM factor and ethnicity was significant,  $F=6.83$ ,  $p=0.012$ , and  $\eta^2=0.03$ , with a very small effect size. This suggests that while the effect size is small, ethnicity may interact with the RM factor to influence emotional eating scores under certain conditions. Thus, H5 stating that there will be a significant difference between student stress and emotional eating across ethnicity is partially supported, with a small but significant interaction effect.



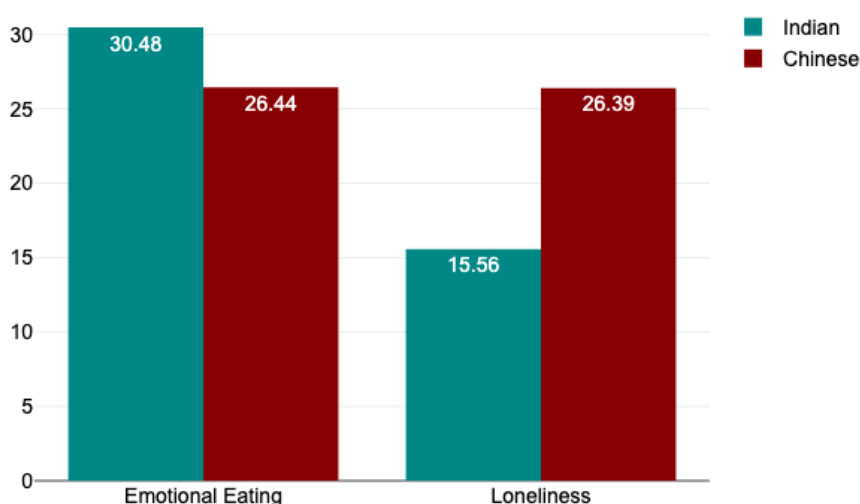
*Figure 5 shows the ethnicity of the respondents on emotional eating and family attachment*

*Table 9 shows the ANOVA values for family attachment on emotional eating across ethnicity*

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
<b>Emotional Eating, Family attachment</b>	22467.6	1	22467.6	270.47	<.001	0.73
<b>Age</b>	831.3	1	831.3	9.59	.003	0.03
<b>RM Factor x Age</b>	101.4	1	101.4	1.22	.275	0
<b>Residuals (Between Subjects)</b>	3725.7	43	86.64			
<b>Residuals (Within Subjects)</b>	3572	43	83.07			

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Table 9 represents the results of ANOVA examining the effect of family attachment on emotional eating score as well as the main effect of ethnicity and its interaction with the repeated measures factor (RM). Significant main effect was found for emotional eating and family attachment  $F=270.47$ ,  $p<0.001$ ,  $\eta^2= 0.73$ , indicating that family attachment significantly influenced emotional eating behavior, with a large effect size. Additionally, the main effect of ethnicity  $F=9.59$ ,  $p=0.03$ , and  $\eta^2= 0.03$  was significant and showed a small effect size. This indicates that ethnicity counts for a small but significant variance in emotional eating scores. However, the interaction effect between the RM factor and ethnicity was not significant,  $F=1.22$ ,  $p=0.275$ , and  $\eta^2= 0$ , indicating no meaningful interaction between the RM factor and ethnicity in predicting emotional eating score. Thus, H6 stating that there will be a significant difference between family attachment and emotional eating across ethnicity is partially supported, with ethnicity showing a significant main effect, but no significant interaction with the RM factor.



*Figure 6 shows the ethnicity of the respondents on emotional eating and loneliness*

*Table 10 shows the ANOVA values for loneliness and emotional eating across ethnicity*

	Sum of Squares	df	Mean Square	F	p	$\eta^2$
<b>Emotional Eating, Loneliness Scale</b>	1813.51	1	1813.51	18.26	<.001	0.12
<b>Age</b>	249.42	1	249.42	1.44	.236	0.02
<b>RM Factor x Age</b>	1194.09	1	1194.09	12.02	.001	0.08
<b>Residuals (Between Subjects)</b>	7433.73	43	172.88			
<b>Residuals (Within Subjects)</b>	4270.4	43	99.31			

Table 10 displays the results of repeated measures ANOVA examining the effect of loneliness on emotional eating score as the repeated measures factor with ethnicity as a between subjects factor. The main effect of the repeated measure factor (loneliness and emotional eating) was statistically significant with  $F=18.26$ ,  $p<0.001$ ,  $\eta^2= 0.12$ , indicating a small to medium effect size. The main effect of ethnicity  $F=1.44$ ,  $p=0.236$ , and  $\eta^2= 0.02$  was not significant and showed a negligible effect size. However, the interaction effect of RM factor and ethnicity was significant,  $F=12.02$ ,  $p=0.001$  ( $p<0.05$ ), and a small effect size of  $\eta^2= 0.08$ , indicating that the relationship between emotional eating scores and loneliness

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scores varies depending upon ethnicity. Therefore, H7 which states that there will be a significant difference between loneliness and emotional eating across ethnicity is supported. Additionally, a significant interaction effect indicates that the relationship between loneliness and emotional eating is influenced by ethnicity.

**Table 11 shows the correlation between Student Stress, Emotional Eating, Family attachment, and Loneliness**

		IRSS	ASSS	TSSS	Student Stress	Emotional Eating	Family attachment	Loneliness
<b>IRSS</b>	Correlation	1	0.6	0.53	0.8	-0.02	-0.65	0.58
	p		<.001	<.001	<.001	.901	<.001	<.001
<b>ASSS</b>	Correlation	0.6	1	0.52	0.87	0.15	-0.48	0.46
	p	<.001		<.001	<.001	.328	.001	.002
<b>TSSS</b>	Correlation	0.53	0.52	1	0.83	0.01	-0.35	0.47
	p	<.001	<.001		<.001	.968	.018	.001
<b>Student Stress</b>	Correlation	0.8	0.87	0.83	1	0.07	-0.56	0.58
	p	<.001	<.001	<.001		.646	<.001	<.001
<b>Emotional Eating</b>	Correlation	-0.02	0.15	0.01	0.07	1	0.12	0.22
	p	.901	.328	.968	.646		.444	.155
<b>Family attachment</b>	Correlation	-0.65	-0.48	-0.35	-0.56	0.12	1	-0.54
	p	<.001	.001	.018	<.001	.444		<.001
<b>Loneliness</b>	Correlation	0.58	0.46	0.47	0.58	0.22	-0.54	1
	p	<.001	.002	.001	<.001	.155	<.001	

\*IRSS = Interpersonal relationship subscale, ASSS = Academic Stress subscale, TSSS = Transportation stress subscale.

\*IRSS, ASSS, TSSS are part of the student stress scale

The findings from this table indicate that IRSS and ASSS ( $r= 0.6, p<0.001$ ), IRSS and TSSS ( $r=0.53, p<0.001$ ), IRSS and Student Stress ( $r=0.8, p<0.001$ ), IRSS and Loneliness ( $r=0.58, p<0.001$ ) are all strongly positively correlated. Additionally, IRSS shows a significant negative correlation with family attachment ( $r=-0.65, p<0.001$ ). ASSS also has significant positive correlations with TSSS ( $r=0.52, p<0.001$ ), Student Stress ( $r=0.87, p<0.001$ ), and Loneliness ( $r=0.46, p=0.002$ ). Moreover, ASSS has a significant negative correlation with Family Attachment ( $r= -0.48, p=0.001$ ). There is a significant positive relationship between TSSS and Student Stress ( $r=0.83, p<0.001$ ), as well as TSSS and Loneliness ( $r=0.47, p=0.001$ ). TSSS is also negatively correlated with Family Attachment ( $r= -0.35, p=0.018$ ). A significant positive correlation exists between Student Stress and Loneliness ( $r=0.58, p<0.001$ ), while a significant negative correlation with Family Attachment ( $r= -0.56, p<0.001$ ) is also observed. Lastly, Family Attachment and Loneliness show a significant negative correlation ( $r= -0.54, p<0.001$ ). Emotional eating, however, did not have a significant positive or negative correlation with any of the variables. Thus, H8, which proposed a strong correlation between student stress, emotional eating, family attachment, and loneliness is partially supported because significant correlations were found between the variables, except for emotional eating.

## DISCUSSION

The investigations from the present study revealed variations in student stress, emotional eating, family attachment, and feelings of loneliness between gender groups. Findings of the current research held that gender groups lacked a significant difference with regard to the four variables under consideration, implying that gender might not significantly affect these psychological and emotional aspects. In terms of student stress, the results demonstrated no significant difference between genders. Some previous studies examining gender differences in student stress have shown inconsistent outcomes. For example, Sheridan et al., (2019) reported how women students tend to have higher stress levels when compared with the

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other gender group of students. This finding was in alignment with the gender socialization theory that suggests women face more stress due to nurturing roles and academic pressures. However, on the other hand, Sagita et al. (2021) announced that there did not exist any significant difference across genders in academic stress. This finding has been in tune with the findings of the current research. The present research goes against the assumption that women have higher stress levels than male respondents, particularly in academic contexts. The lack of significant difference could suggest that the academic pressures that students face are not moderated by gender. One possible reason for this unexpected finding could be the use of a more homogenous sample. If the sample was predominantly from a specific type of demographics (e.g. students in the same course), gender differences might have been less distinct due to shared experiences.

The results held that there was no noteworthy difference across genders even when it came to the variable of emotional eating. However, this has been refuted by previous literature, showing that women were more likely to engage in emotional eating, especially while under stress (Pascual et al., 2012; Thompson et al., 2015). However, in support of the current findings, Nguyen-Rodriguez et al (2009b) also found no significant gender differences in emotional eating among adolescents. This indicates that gender has less of an impact on emotional eating as anticipated. Both male and female students may use food as a coping mechanism to manage academic pressures.

Even with regard to the variable of family attachment, there was no significant difference reported across gender. This result contrasts with earlier studies such as Hasmalawati and Hasanati (2019), wherein the researchers found that attachment level tends to differ in male and female university students. However, research by Muraru & Turluc (2013c) argues that gender roles do not significantly affect family attachment. The present findings suggest that family attachment is not strongly influenced by gender, but may be shaped by individual factors such as family dynamics or the availability of support.

Lastly, loneliness also showed no significant gender differences, with a very small effect size. This finding contrasts somewhat with some studies that often reveal that women experience higher levels of loneliness compared to men (Rokach, 2018). However, there have been studies such as one by Bagaskara et al. (2022) which discovered that during the COVID-19 pandemic, there was no significant difference in the levels of loneliness between male and female college students. The findings of the present research suggest that loneliness can be determined by multiple other factors including academic and societal pressures, and not just by gender.

Within the present research, age differences have also been examined in light of the different variables. Findings have revealed no notable differences between age groups in terms of student stress or emotional eating behaviors. Additionally, the effect sizes were small, further suggesting that any differences were negligible. A key assumption underlying this hypothesis is that older students have greater responsibilities to withhold, as a result of that, their stress levels tend to be higher and they might resort to behaviours like emotional eating as a form of coping mechanism. This assumption aligns with some studies which have suggested that older students often report greater stress due to the many responsibilities they face. For example, Oliveira et al (2016) reported that when students demonstrate a high stress level, they also report higher on emotional and uncontrollable eating behaviours particularly with unhealthy and junk food. However, the current study's findings supported

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this prediction. The lack of significant differences across age groups suggests that student stress and emotional eating might not be as heavily influenced by age as anticipated.

When studying the relationship between family attachment and emotional eating across age groups, no significant differences were reported in the present study. The belief that younger students, who rely more on familial support, would experience stronger family attachment and in turn engage in more emotional eating as a coping mechanism. On the other hand, older students who are more independent were expected to exhibit lower levels of emotional eating. This view aligns with the study conducted by Samuel & Cohen (2018) which found that although emotional eating occurs at every age, it tends to decrease with age. However, the lack of significant differences in the present study suggests that family attachment may not differ in its impact on emotional eating across age groups as expected. This could be because family dynamics are often influenced by many factors such as the frequency of interactions, the overall emotional support, and more, this specifically may not change significantly with age.

This study aimed to explore the correlation between loneliness and emotional eating across various age groups. However, the findings showed that age may not have a substantial impact on the relationship between loneliness and emotional eating, since the findings did not reveal any significant differences between the age groups regarding loneliness or emotional eating, suggesting that age may not have a strong influence on the relationship between these two factors. One possible explanation for this is that loneliness is a multifaceted and subjective experience, which can vary across different life stages, while social loneliness remains stable until declining later in life, emotional loneliness peaks in younger and older adulthood (Manoli et al., 2022). Many students eat less during negative emotions but maintain or increase food intake when feeling lonely or happy (Alalwan et al., 2019). Another explanation for the lack of significant findings could be the sample characteristics of the present study. If the sample was homogenous in terms of factors like socioeconomic background, academic program or living situations, age-related differences in loneliness and emotional eating may have been less apparent.

When investigating the relationship between student stress and emotional eating across different ethnic groups, a significant interaction effect was found between ethnicity and the repeated measures (RM) factor in emotional eating behavior. However, the main effect of ethnicity wasn't significant, with a negligible effect size, suggesting that ethnicity alone doesn't significantly influence emotional eating. Alternatively, the significant main effect of student stress indicates that stress does in fact have a crucial role in participation in emotional eating behaviours. This corresponds with Caso et al. (2020), who found that academic stress can impact unhealthy eating differently across nationalities, with Italian students increasing and French students decreasing food consumption. Bell et al. (2021) in their research found that among adolescents of colour, particularly Hispanic/Latino ones, emotional eating tends to partially mediate the relationship between stress and dietary food intake.

The current study looked at how emotional eating and familial attachment may relate across different ethnic groups. Ethnicity showed a significant main effect on emotional eating, indicating that ethnicity accounts for a small but significant variance in emotional eating scores. This finding suggests that cultural factors related to family attachment might influence emotional eating behavior, which aligns with research conducted by Tsai et al.

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(2006), demonstrating that cultural factors have a greater influence on emotional eating than temperamental factors, suggesting that cultural aspects related to family attachment might influence emotional eating behavior. However, the significant main effect of family attachment, with a large effect size, indicates that family attachment is a more prominent factor influencing emotional eating. This result is consistent with findings by Faber et al. (2017), who found that individuals with higher attachment security, anxiety, avoidance, and fearfulness are more likely to engage in unhealthy eating behaviors, including emotional eating.

This study explored the relationship between loneliness and emotional eating across different ethnic groups. In predicting emotional eating, a significant interaction effect between loneliness and ethnicity was discovered, suggesting that loneliness and emotional eating scores vary depending on ethnicity. This finding aligns with a study on university students, which revealed that loneliness can trigger increased food intake, with many students reporting eating more when feeling lonely (Alalwan et al., 2019). While the main effect of loneliness on emotional eating was significant, the main effect of ethnicity wasn't significant. This supports the idea that the way loneliness affects eating behaviors may vary depending on how it is experienced or expressed. Research done by Rokach (2018) supports this idea by suggesting that women often express greater loneliness and that experiences differ between collectivist and individualistic cultures.

Strong correlations were found between student stress, family attachment, and loneliness. In particular, student stress revealed a positive correlation with loneliness and a negative correlation with family attachment, indicating that higher stress levels were linked to greater loneliness and weaker family attachment. This finding is consistent with a study by Munir et al. (2015), which indicated that loneliness and academic stress are positively correlated among college students. Additionally, research by Knutson & Woszidlo (2014) found that family disengagement is linked to reduced family support, greater loneliness, and increased stress. However, there was no significant correlation between student stress and emotional eating. This suggests that additional factors could have an impact on emotional eating, as supported by Bongers et al. (2016), who found that emotional eaters tend to overeat in response to various cues, including positive emotions and food exposure.

### **CONCLUSION**

This research paper delved into the intricate connection between emotional eating and the various psychological and social factors that could contribute to it, particularly among Indian and Chinese adolescents residing in Singapore. Emotional eating, which is different from physical hunger, is driven by emotions and can lead to cycles of overeating and guilt. As emotional eating becomes an increasingly prevalent coping mechanism for many adolescents, it is important to understand how factors like student stress, family attachment, and loneliness influence emotional eating. The aim of this study was to examine the relationship between loneliness, student stress, family attachment, and emotional eating, particularly its prevalence in Indian and Chinese adolescents.

The findings of this study have several implications. Firstly, the lack of significant age and gender differences in emotional eating may suggest that factors such as stress, loneliness, and family dynamics play a more significant role compared to age or gender. The significant role of student stress in emotional eating could highlight the importance of schools and families implementing stress management programs to mitigate emotional eating as a coping

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mechanism, as many families and educational institutions in Asia particularly, emphasize greater academic performance, leading to an increase in stress levels in adolescents. Additionally, since family attachment was found to be a critical factor, families should encourage communication and secure attachment within families so that students feel more comfortable and can turn to their family members instead of food, thus reducing emotional eating. Due to the limited correlation with emotional eating, future research could investigate additional factors which may have influenced emotional eating to gain a better understanding of the behaviors.

### ***Limitations of the study:***

Although this study offers valuable insights, there are various limitations that need to be acknowledged. Firstly, the study requires a greater sample size to adequately represent the diversity within Indian and Chinese adolescents, including family attachment, loneliness, and student stress. Additionally, the findings of the present study are restricted to Indian and Chinese adolescents living in Singapore and hence are not applicable to other cultural settings. Lastly, since the study made use of survey method social desirability might be at play wherein respondents could have given socially acceptable answers in order to avoid embarrassment or due to fear of judgement.

### ***Future recommendations:***

Future research should incorporate a bigger sample size as this would enhance the generalizability, reliability, and control false findings. It should also include adolescents from different cultural backgrounds. Researchers could potentially investigate emotional eating behaviors in individualistic (western societies) versus collectivist (eastern societies) cultural dimensions. Through conducting a mixed method research, more in-depth responses can be generated, for example, using interviews as an addition to the survey, to gain more in-depth insights into the experiences of the participants.

Emotional eating can be regulated through techniques such as deep box breathing to balance the sympathetic and parasympathetic systems. Creating a regular meal plan or keeping a food journal can also help in regulating emotional eating behaviour. Other techniques may include urge surfing and mindful eating practices.

To alleviate loneliness, it is crucial to stop negative thought cycles; volunteering or interacting with unfamiliar people may help by building in-person connections.

Managing academic stress can involve exercising, managing time well, ensuring adequate sleep, prioritizing self-care, maintaining a positive mindset, practicing mindfulness, listening to music, and taking regular breaks. Families should provide support to their members and spend time together, such as eating meals together, to strengthen bonds and decrease loneliness and emotional eating. Strong family bonds can be cultivated through open communication, spending time together, active listening, and fair conflict resolution.

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***Conflict of Interest***

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