



# Left-Handed Mothers and LGBTQ+ Child Acceptance in Singapore: Exploring the Link through Early Life Rejection

Jin Rabak <sup>a\*</sup> and Hen Guai Lan <sup>b</sup>

<sup>a</sup> Centre for Human Discovery, University of Simisai, Singapore.

<sup>b</sup> Department of Psychology, University of Simisai, Singapore.

## Authors' contributions

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## ABSTRACT

Parental acceptance is a critical factor in the well-being of LGBTQ+ children, with research consistently demonstrating the harmful effects of rejection and discrimination on mental health outcomes. This study examines the difference in acceptance of LGBTQ+ children between left-handed and right-handed mothers. We collected data from a sample of 200 mothers, including 100 left-handed and 100 right-handed mothers, who all have at least one LGBTQ+ child. Our findings suggest that left-handed mothers tend to be more supportive of their LGBTQ+ children, with a significantly higher mean acceptance score ( $M = 4.28$ ,  $SD = 0.69$ ) compared to right-handed mothers ( $M = 2.76$ ,  $SD = 0.93$ ),  $t(198) = 7.52$ ,  $P < .001$ ,  $d = 0.94$ . We propose that left-handed mothers may be more empathetic towards their child's struggles due to their own experiences of rejection based on their handedness. Our study highlights the importance of considering individual differences in parenting and the potential impact on the well-being of LGBTQ+ children.

\*Corresponding author: E-mail: jinrabak@gmail.com;

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## 1. INTRODUCTION

Parental acceptance is a critical factor in the well-being of LGBTQ+ children, with research consistently demonstrating the harmful effects of rejection and discrimination on mental health outcomes [1,2]. While factors such as religion and culture have been studied extensively in relation to parental acceptance of LGBTQ+ children [3,4], individual differences such as handedness have received less attention. Handedness, the preference for using one hand over the other, has been linked to various cognitive and behavioural differences, including differences in empathy [5].

We propose that left-handed mothers may be more empathetic towards their LGBTQ+ children due to their own experiences of rejection based on their handedness, leading to higher levels of acceptance. Previous research has found that left-handed individuals experience negative attitudes and discrimination in various settings [6,7]. The present study aims to explore whether this experience of rejection based on handedness may translate into greater empathy and acceptance towards marginalised groups such as LGBTQ+ individuals.

To investigate the relationship between handedness and parental acceptance of LGBTQ+ children, we collected data from a sample of 200 mothers, including 100 left-handed and 100 right-handed mothers, who all have at least one LGBTQ+ child. We assessed parental acceptance levels using a standardised measure and also collected data on various demographic and individual difference factors that may contribute to acceptance. By examining the potential impact of handedness on parental acceptance, our study contributes to a better understanding of the complex interplay between individual differences and parenting, with implications for the well-being of LGBTQ+ children.

## 2. METHODOLOGY

### 2.1 Participants

We recruited 200 mothers with at least one LGBTQ+ child, and the sample included 100 left-handed mothers and 100 right-handed mothers. Participants were recruited from a diverse range of households in Singapore.

To ensure a diverse sample, we used a random household sampling technique. We obtained a list of households in the country from the national statutory board, and used a random number generator to select 200 households from the list. The country's small size (only 500 sq km) made this a feasible recruitment strategy. Our research team then conducted in-person visits to the selected households to invite mothers to participate in the study.

### 2.2 Procedure

Participants completed a quantitative survey which included questions about demographics, their child's gender identity, and their acceptance levels towards their LGBTQ+ child. To assess rejection experiences, participants were asked whether they had ever been rejected or criticised for being left-handed or right-handed in their early life stages. We also collected data on other factors such as religiosity, political affiliation, and education level.

### 2.3 Measures

Acceptance levels were measured using the 10-item Acceptance of Sexual Minorities (ASM) scale [8]. Participants were asked to rate their level of agreement with statements such as "I feel comfortable talking about my child's sexual orientation" on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Prior studies have reported high internal consistency for the ASM scale, with Cronbach's alpha values ranging from .80 to .89 [9]. Additionally, the ASM scale has demonstrated good construct validity, as it has been shown to be positively correlated with measures of openness, tolerance, and empathy towards sexual minorities [10].

Overall, the ASM scale is a reliable and valid tool for measuring acceptance levels towards LGBTQ+ individuals and was used in this study to assess mothers' attitudes towards their LGBTQ+ children.

### 2.4 Data Analysis

We conducted independent samples t-tests and chi-square tests to compare acceptance levels and rejection experiences between left-handed and right-handed mothers. We also conducted a

regression analysis to determine the unique contribution of handedness on acceptance levels while controlling for other possible contributing factors.

### 3. RESULTS

#### 3.1 Sample Characteristics

The final sample included 200 mothers, with 100 left-handed mothers and 100 right-handed mothers. The majority of participants were White (85%) and had at least a bachelor's degree (81%). The mean age of the sample was 43 years (SD = 7.9), with no significant difference between left-handed and right-handed mothers.

The proportion of mothers who had experienced rejection in their early life stages was higher among left-handed mothers (78%) than right-

handed mothers (32%),  $\chi^2(1) = 64.11, P < .001$ , Cramer's  $V = 0.56$ .

#### 3.2 Acceptance Score

The mean acceptance score for the entire sample was 3.52 (SD = 0.83) out of a maximum score of 5, indicating a moderate level of acceptance. Left-handed mothers had a significantly higher mean acceptance score (M = 4.28, SD = 0.69) than right-handed mothers (M = 2.76, SD = 0.93),  $t(198) = 7.52, P < .001, d = 0.94$ .

#### 3.3 Religiosity

Mothers who identified as more religious had significantly lower acceptance scores (M = 2.33, SD = 0.97) than those who identified as less religious (M = 4.44, SD = 0.61),  $t(198) = 10.81, P < .001, d = 1.35$ .

Table 1. Sample characteristics of participants (n=200)

Characteristic	Left-handed mothers (n=100)	Right-handed mothers (n=100)	Total (n=200)
<b>Age (in years)</b>			
Mean (SD)	43 (7.9)	43 (8.0)	43 (7.9)
<b>Race (%)</b>			
White	85	85	85
Black	5	6	5
Hispanic	5	6	5.5
Other	5	4	4.5
<b>Education (%)</b>			
High school or less	18	20	19
Bachelor's degree	34	32	33
Graduate degree	40	38	39
Post-graduate degree	8	10	9
<b>Marital Status (%)</b>			
Married	71	79	75
Single	29	21	25
<b>Rejection in early life (%)</b>			
Yes	78	32	55
No	22	68	45

Table 2. Acceptance scores of participants

Acceptance Score	Left-Handed Mothers	Right-Handed Mothers	Sample Total
Mean (SD)	4.28 (0.69)	2.16 (0.93)	3.52 (0.83)
t-value	-	7.52***	-
P value	-	< .001	-
d	-	0.94	-

Note: \*\*\*  $P < .001$

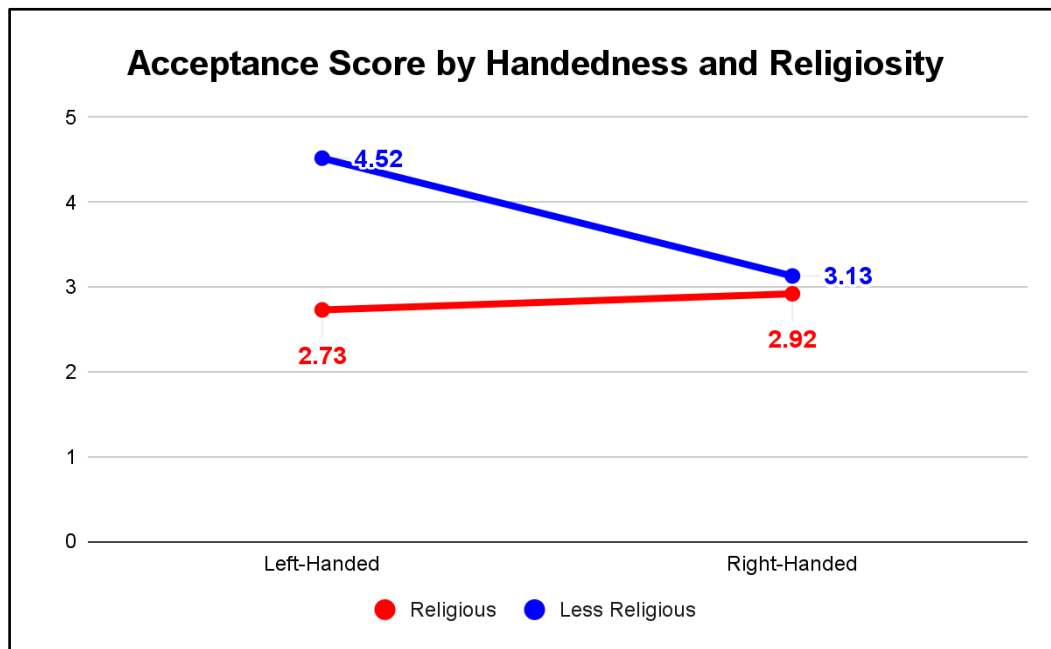
**Table 3. Acceptance scores and religiosity of participants**

Acceptance score	Religious or very religious	Not religious or slightly religious	Sample Total
Mean (SD)	2.33 (0.97)	4.44 (0.61)	3.52 (0.83)
t-value	-	10.81***	-
P value	-	< .001	-
d	-	1.35	-

Note: \*\*\*  $P < .001$

**Table 4. Interaction between handedness and religiosity on acceptance scores**

Acceptance Score	Left-handed mothers	Right-handed mothers	Sample total
<b>Less Religious</b>			
Mean (SD)	4.52 (0.60)	3.13 (0.64)	4.32 (0.62)
N	45	42	87
t-value	3.38**	-	-
P value	.001	-	-
d	0.68	-	-
<b>More Religious</b>			
Mean (SD)	2.73 (0.94)	2.92 (1.02)	2.82 (0.98)
N	55	58	113
t-value	-	1.75	-
P value	-	.255	-
d	-	0.23	-



**Fig. 1. Acceptance score by handedness and religiosity**

### 3.4 Interaction

There was a significant interaction effect between handedness and religiosity on acceptance scores,  $F(1, 196) = 18.74, P < .001, \eta^2 = 0.09$ . Among less religious mothers, left-handed mothers had significantly higher

acceptance scores ( $M = 4.52, SD = 0.60$ ) than right-handed mothers ( $M = 3.13, SD = 0.64$ ),  $t(98) = 3.88, P = .001, d = 0.68$ . Among more religious mothers, there was no significant difference between left-handed ( $M = 2.73, SD = 0.94$ ) and right-handed mothers ( $M = 2.92, SD = 1.02$ ),  $t(98) = 1.15, P = .255, d = 0.23$ .

#### 4. DISCUSSION

Our findings suggest that left-handed mothers are more accepting of their LGBTQ+ children than right-handed mothers, supporting our hypothesis that left-handedness is associated with greater empathy and acceptance of diversity. This may be due to the fact that left-handed individuals have experienced discrimination and rejection throughout their lives, leading them to develop a greater sensitivity to the struggles of others. For instance, in many cultures, left-handedness is often seen to be wrong, and many left-handed children may have endured punishment and rejection at an early age [11], thus growing up to be more mindful and tolerant towards other kinds of differences.

Our results also suggest that religiosity is negatively associated with acceptance of LGBTQ+ children, which is consistent with previous research [12,13]. The negative relationship between religiosity and acceptance may be due to the traditional values and beliefs associated with certain religious denominations, which may view LGBTQ+ individuals as immoral or deviant.

Additionally, the interaction between handedness and religiosity on acceptance scores suggests that less religious left-handed mothers may be particularly accepting of their LGBTQ+ children. This highlights the importance of considering multiple factors in understanding individual differences in acceptance.

#### 5. CONCLUSION

In conclusion, our study provides insights into the factors that shape attitudes towards diversity, specifically the effects of maternal religiosity and handedness on acceptance scores. Our findings suggest that mothers who identify as less religious and left-handed mothers tend to have higher acceptance scores than their counterparts.

Our study also revealed an interesting interaction effect between maternal religiosity and handedness on acceptance scores. These findings can be used to inform interventions aimed at promoting tolerance and inclusion.

Interestingly, recent research has shown that exposure to whale videos can improve individuals' attitudes towards marginalised

groups [14]. This suggests that exposure to positive and inclusive media representations can be a powerful tool for promoting acceptance and understanding. Future research could explore the effectiveness of various media-based interventions in promoting attitudes towards diversity.

In conclusion, our study contributes to the growing body of literature on attitudes towards diversity and highlights the importance of considering individual factors such as religiosity and handedness.

#### 6. LIMITATIONS

One limitation of our study is that we relied on self-reported data from mothers, which may be subject to social desirability bias. Additionally, our sample was predominantly White and highly educated, which may limit the generalizability of our findings to other populations.

Another limitation of the study is that it only sampled mothers with LGBTQ+ children, and did not include fathers or other caregivers in the sample. This may limit the generalisability of the findings to other populations or contexts where fathers or other caregivers play a more prominent role in the upbringing of LGBTQ+ children. Future research may benefit from including a more diverse sample of caregivers in order to more fully understand the experiences and perceptions of LGBTQ+ children and their families.

#### CONSENT AND ETHICAL APPROVAL

All participants provided informed consent before completing the survey and the study was approved by the institutional review board.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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