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| **PSYC206: Data Analysis Report: Part B**  **One-way Repeated Measures ANOVA and Simple Linear Regression**  **Word count: 700 words (excluding SPSS Output, Tables, Figures and References)** |

**Student Declaration**

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**Results**

Descriptive statistics for facial expressivity in each of the three emotions measured are presented in Table 1.

**Table 1**

*Means and Standard Deviations for Facial Expressivity in each emotion category*

|  |  |  |
| --- | --- | --- |
| Emotion Category | *M* | *SD* |
| Sad | 69.1 | 22.2 |
| Happy | 76.6 | 20.4 |
| Angry | 38.3 | 30.3 |

The assumption of independent observations was met by the design of the study. A Shapiro-Wilk test of normality was conducted on the facial expressivity results, showing that the assumption of normality was violated for all three emotion categories (*p*s < .05) but was robust due to the large sample size (*n*= 50), so the tests proceeded with caution. Mauchly’s test of sphericity revealed that the assumption of sphericity was violated (*p* = .011), so the Huynh-Feldt correction was employed.

A one-way repeated measures ANOVA revealed that the discrete emotion category had a significant main effect on mean facial expressivity, *F*(1.76, 86.4) = 43.36, *p* < .001, ηp2 = .57. Pairwise Bonferroni comparisons revealed that participants were significantly more likely to score lower in facial expressivity for anger than with happiness, *p* < .001, and sadness, *p* < .001. There was no significant difference between scores for happiness and sadness, *p* = .107.

Linear regression coefficients for each of the three emotion categories are shown in Table 2 with participant age as the predictor for facial expressivity.

**Table 2**

*Unstandardized B, coefficients standard error, and standardized coefficient beta for each regression*

|  |  |  |  |
| --- | --- | --- | --- |
| Model | *B* | *SE B* | β |
| Sad  Constant  Age | 89.29  -2.16 | 21.01  2.23 | -.14 |
| Happy  Constant  Age | 132.95  -6.015 | 17.69  1.87 | -.42 |
| Angry  Constant  Age | 44.22  -.63 | 29.05  3.07 | -.03 |

A simple linear regression revealed that no significant proportion of facial expressivity in sadness was accounted for by age, *F*(1, 48) = 0.94, *p* = .338. The unstandardized slope was not significantly different from 0, *t*(48) = -0.97, *p* = .338. R squared indicated that 1.9% of the variation in facial expressivity score was predicted by age.

A simple linear regression revealed that a significant proportion of facial expressivity in happiness was accounted for by age, *F*(1, 48) = 10.36, *p* = .002. The unstandardized slope was significantly different from 0, *t*(48) = -3.22, *p* = .002. R squared indicated that 17.8% of the variation in facial expressivity score was predicted by age.

A simple linear regression revealed that no significant proportion of facial expressivity in anger was accounted for by age, *F*(1, 48) = 0.42, *p* = .838. The unstandardized slope was not significantly different from 0, *t*(48) = -0.21, *p* = .838. R squared indicated that 0.01% of the variation in facial expressivity score was predicted by age.

**Discussion**

The aim of the study was to uncover how the expression of emotion develops over the course of childhood. The findings support the hypotheses whereby children would display greater facial expressivity for happiness than anger, and reduced facial expressivity for anger compared to that of sadness. However, no evidence was found which supported the hypothesis that children would display greater facial expressivity for happiness than for sadness. The hypothesis that age would be a significant predictor of children’s facial expressivity for happiness was reported by the results of this study, but no supporting evidence was found to support the hypothesis whereby age would be a predictor for children’s facial expressivity for sadness. Lastly, the results of the study are congruent with the expectation that age would not act as a predictor for children’s facial expressivity for anger.

These results suggest that understanding of emotion – which is also often tied with age – may be a factor in how intensely emotions are expressed when compared to previous research such as Herba et al. (2006). The implications of such a correlation would go a long way in understanding why individuals on the autism spectrum often demonstrate behaviour attributed to emotional immaturity, since autism often impairs one’s ability to understand or interpret emotion in others.

The current study was limited by a lack of counterbalancing for the repeated measures design and individual differences. If certain emotion-eliciting stimuli was often tested last, it could skew the results. A child’s emotional understanding and temperament may be a factor in how intensely they display certain facial expressions. In future, incorporating counterbalancing into the study design would better ensure results are not skewed either way. Furthermore, Wang et al. (2014) indicated a rapid development of emotional understanding in children from ages 3-7.

It is therefore recommended that future studies incorporate a longitudinal design over several years starting at an earlier age in a repeated-measures experiment that incorporates specific counterbalancing measures. This would allow for a better measure an individual’s evolution with facial expressivity and at what age certain emotion-related milestones are met. It would also be beneficial to include individuals on the autism spectrum for the longitudinal study to better understand the relationship between emotional understanding and how intensely emotions are expressed.

In conclusion, the study found facial expressivity for happiness and sadness was significantly stronger than anger in children, but that there was no significant difference between facial expressivity for happiness and sadness. Furthermore, facial expressivity became significantly less intense with age for happiness only. It is advised that future studies employ a longitudinal design to measure individual progression.

**References**

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