h (2016) revealed that Akaike Information Criteria (AIC) is a well-known information criterion, for evaluating the data-fitting performance of a model. The model with the smallest AIC is the best as describing the greatest amount of information with the smallest amount of variables (Bevans, 2021). It is necessary for checking the model assumption, to guarantee that model can be applied. The assumptions were examined by all four plots in **figure 3.7**, the explanation and examination of assumption plots were written below.

According to the plot, Residuals vs Fitted Values in **figure 3.7**, the pattern of residuals is not obvious, suggesting that the assumption of linear or curvilinear is acceptable. The residuals spread equally around the zero line, proved that the error terms have the same variance. Outliers, additionally do not exist as no residual standing away from the pattern (Department of Statistics Online Programs, 2018); Although having a light tail, Normal Q-Q plot suggested that the dependent variables, inside the model, are normally distributed (Ford, 2015). In the Scale-Location plot, Since the red line is approximately horizontal across the plot, with no clear pattern. In this way, the spreading of the residuals is random, as well as in the neighborhood of equal for all fitted values. (Zach, 2020). Observing Residuals Vs Leverage, the last plot in **figure 3.7**, there is no points affecting the trend much. In this way, there are no outliers. Based on the graphs in **figure 3.7**, the polynomial linear regression model, demonstrated in the summary, was applied for studying the relations between Pokémon Go and the amount of physical activity. The detailed final model was demonstrated in **formula 3.8**.

*PhysicalActivity* = β0+β1\**age* + β2\**education* + β3\**Gender* + β4\**Attitude* + β5\**PokemonGo\_AppUsage* + β6\**PokemonGo\_Relate.Behaviour* + α1\**Attitude*^2 + α2\**PokemonGo\_Relate.Behaviour*^2 + α3\**age*\**education* + α4\**education*\**Attitude* + ϵ

* β0 is the intercept of the model
* β1 represents the estimate of variable *age*
* β2 represents the estimate of variable *education*
* β3 represents the estimate of variable *Gender*
* β4 represents the estimate of variable *Attitude*
* β5 represents the estimates of variable *PokemonGo\_AppUsage*
* β6 represents the estimates of variable *PokemonGo\_Relate.Behaviour*
* α1 represents the estimates of interaction term of the *Attitude* itself
* α2 represents the estimates of interaction term of the variable *PokemonGo\_Relate.Behaviour* itself
* α3 represents the estimates of interaction term of variables *age* and *education*
* α4 represents the estimates of interaction term of variables *education* and *Attitude*
* ϵ represented the error terms of the model, with an assumption of normal distribution

*PhysicalActivity* = β0+β1\**age* + β2\**education* + β3\**Gender* + β4\**Attitude* + β5\**PokemonGo\_AppUsage* + α1\**Attitude*^2 + α2\**age*\**education* + α3\**education*\**Attitude* + ϵ

* β0 is the intercept of the model
* β1 represents the estimate of variable *age*
* β2 represents the estimate of variable *education*
* β3 represents the estimate of variable *Gender*
* β4 represents the estimate of variable *Attitude*
* β5 represents the estimates of variable *PokemonGo\_AppUsage*
* α1 represents the estimates of interaction term of the *Attitude* itself
* α2 represents the estimates of interaction term of variables *age* and *education*
* α3 represents the estimates of interaction term of variables *education* and *Attitude*
* ϵ represented the error terms of the model, with an assumption of normal distribution

*PhysicalActivity* = β0+β1\**age* + β2\**education* + β3\**Gender* + β4\**Attitude* + β5\**PokemonGo\_AppUsage* + β6\**PokemonGo\_Relate.Behaviour* + β7\**social\_sharing* + α1\**age*^2 + α2\**education*^2 +α3\**Attitude*^2 + α4\* *PokemonGo\_AppUsage*^2 +α5\**social\_sharing*^2 + α6\**PokemonGo\_Relate.Behaviour*^2 + γ1\**age*\**education* + γ2\**age*\**Gender* + γ3\**age*\**Attitude*+ γ4\**age*\**PokemonGo\_AppUsage* + γ5\**age*\**social\_sharing*+ γ6\**age*\**PokemonGo\_Relate.Behaviour* + γ7\**education*\*Gender+ γ8\**education*\**Attitude* + γ9\**education*\**PokemonGo\_AppUsage*+ γ10\**education*\**social\_sharing*+ γ11\**education*\**PokemonGo\_Relate.Behaviour* + γ12\**Gender*\**Attitude*+ γ13\**Gender*\**PokemonGo\_AppUsage*+ γ14\**Gender*\**social\_sharing*+ γ15\**Gender*\**PokemonGo\_Relate.Behaviour* + γ16\**Attitude*\**PokemonGo\_AppUsage*+ γ17\**Attitude*\**social\_sharing*+ γ18\**Attitude*\**PokemonGo\_Relate.Behaviour* + γ19\**PokemonGo\_AppUsage*\**social\_sharing* + γ20\**PokemonGo\_AppUsage*\**PokemonGo\_Relate.Behaviour*+ γ21\**social\_sharing*\**PokemonGo\_Relate.Behaviour* + ϵ

* β0 is the intercept of the model
* β1 represents the estimate of variable *age*
* β2 represents the estimate of variable *education*
* β3 represents the estimate of variable *Gender*
* β4 represents the estimate of variable *Attitude*
* β5 represents the estimates of variable *PokemonGo\_AppUsage*
* β6 represents the estimates of variable *PokemonGo\_Relate.Behaviour*
* β7 represents the estimates of variable *social\_sharing*
* α1 represents the estimates of interaction term of the *age* itself
* α2 represents the estimates of interaction term of the *education* itself
* α3 represents the estimates of interaction term of the *Attitude* itself
* α4 represents the estimates of interaction term of the *PokemonGo\_AppUsage* itself
* α5 represents the estimates of interaction term of the variable *social\_sharing* itself
* α6 represents the estimates of interaction term of the variable *PokemonGo\_Relate.Behaviour* itself
* γ1 represents the estimates of interaction term of variables *age* and *education*
* γ2 represents the estimates of interaction term of variables *age* and *Gender*
* γ3 represents the estimates of interaction term of variables *age* and *Attitude*
* γ4 represents the estimates of interaction term of variables *age* and *PokemonGo\_AppUsage*
* γ5 represents the estimates of interaction term of variables *age* and *social\_sharing*
* γ6 represents the estimates of interaction term of variables *age* and *PokemonGo\_Relate.Behaviour*
* γ7 represents the estimates of interaction term of variables *education* and *Gender*
* γ8 represents the estimates of interaction term of variables *education* and *Attitude*
* γ9 represents the estimates of interaction term of variables *education* and *PokemonGo\_AppUsage*
* γ10 represents the estimates of interaction term of variables *education* and *social\_sharing*
* γ11 represents the estimates of interaction term of variables *education* and *PokemonGo\_Relate.Behaviour*
* γ12 represents the estimates of interaction term of variables *Gender* and *Attitude*
* γ13 represents the estimates of interaction term of variables *Gender* and *PokemonGo\_AppUsage*
* γ14 represents the estimates of interaction term of variables *Gender* and *social\_sharing*
* γ15 represents the estimates of interaction term of variables *Gender* and *PokemonGo\_Relate.Behaviour*
* γ16 represents the estimates of interaction term of variables *Attitude* and *PokemonGo\_AppUsage*
* γ17 represents the estimates of interaction term of variables *Attitude* and *education*
* γ18 represents the estimates of interaction term of variables *Attitude* and *PokemonGo\_Relate.Behaviour*
* γ19 represents the estimates of interaction term of variables *PokemonGo\_AppUsage* and *social\_sharing*
* γ20 represents the estimates of interaction term of variables *PokemonGo\_AppUsage* and *PokemonGo\_Relate.Behaviour*
* γ21 represents the estimates of interaction term of variables *social\_sharing* and *PokemonGo\_Relate.Behaviour*
* ϵ represented the error terms of the model, with an assumption of normal distribution