Empathy Among Adolescents Concerning Food Allergies of Their Peers

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ABSTRACT

Food allergies can be defined as having physical reaction(s) to any consumed substance, including anaphylaxis, hives, and nausea. Although many adolescents have food allergies, it was not clear how their peers felt about it or if their awareness impacted their empathy levels. Previous research primarily focused on the scientific aspects of food allergies and how they impact those who possess them. Thus, a study was conducted based off the Interpersonal Reactivity Index (IRI), an established questionnaire that measures empathy, to determine empathy levels among adolescents about their peers' food allergies across four subscales: Perspective-Taking (PD), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD). The questions were altered to measure only empathy levels regarding allergies and were divided into two sections so that empathy was measured before and after factual allergy information was presented to the participants. The survey was distributed among classrooms and social media platforms to adolescents ages 14-19. The responses indicate overall empathy scores experienced a slight decrease from 3.375 to 3 (neutral) after the information was presented. However, when a Chi-square analysis was conducted, $\chi^2 = 0.357$ and $0.357 < 7.815$ (critical value), indicating the decrease was not significant. The findings demonstrate that a paragraph of information is not sufficient as it does not stimulate a significant change in empathy among adolescents regarding their peers' food allergies. Further studies regarding the extent of external empathy influences should be conducted to determine if more exposure is needed to increase empathy.

Introduction

Approximately 20% of children's anaphylactic reactions in the United Kingdom took place at school as reported by A.J. Cummings et al. (2010), an individual part of the University of Southampton School of Medicine in the Division of Infection, Inflammation and Immunity. There is a problem with the elevated levels of food allergies among adolescents and the carefree attitudes of their peers surrounding the issue. Although food allergies are serious and should be taken seriously by one's peers, disregard is present among today's youth. This problem has negatively impacted adolescents with food allergies because there are increased anxiety levels about what they consume without the support that they need. This is demonstrated in my life as I am unable to consume food from class parties and friends' houses, thus reducing my perceived quality of social events. Once I inadvertently ate cashews blended into the food at a friends' house because they did not remember that I have a nut allergy. Due to this, I began vomiting and had swelling in my throat. Medication was administered immediately following consumption so further reactions were avoided.

A possible cause of this problem is that parents, guardians, and the adults in an individual's life do not emphasize the importance of these allergies to adolescents. According to the Memorial Hermann Foundation, an organization based on philanthropic support of patient care, there are multiple allergies present among the population such as ones to peanuts, soy, wheat, milk, and eggs. Allergic reactions occur when the allergen is ingested, inhaled, or even in contact with the individual. People can have multiple reactions such as swelling,

vomiting, and even fatal reactions such as anaphylaxis (swelling in the airway). These reactions must be treated immediately, or they can result in hospitalization; there are approximately 2,000 hospitalizations every year in the United States due to food allergies ("8 Most Common...," n.d.).

Key Review of the Literature

Scientific Aspects of Anaphylactic Reactions

Regarding the scope of these allergic reactions, according to a study led by Branum et al. (2008), the Deputy Associate Director for Science for the Center for Disease Control and Prevention, the number of allergies among children in the United States has increased by 18% from 1997 to 2007. The survey focused on 9,500 children throughout the United States in 2007, the number of children having allergies, and the increase in allergy-related hospitalizations in the United States for the past two decades. Mclean-Tooke et al. (2003), a doctor specializing in allergy and clinical immunology claims in the *British Journal of Medicine* that only two out of the six fatal anaphylactic reactions that occurred over fourteen months administered adrenaline within an hour of first consuming the allergen/stimulant, indicating that treatment for allergic reactions must be administered immediately after the allergic reaction is occurring, or else it may become fatal. When an individual is experiencing an anaphylactic reaction adrenaline auto- injectors are used. This forces the person to release adenosine monophosphate (AMP) and beta receptors, which causes bronchodilation (reduces swelling in the airway). Individuals who experience an anaphylactic reaction are supposed to be hospitalized in serious cases and are to be under observation by another individual for up to twelve hours to ensure no other reactions occur. If the cause of the reaction is unknown, then blood samples must be taken to ensure that it is an allergic reaction (Dzingina et al., 2011).

General Empathy Among Adolescents

Empathy is a factor in how these allergies are perceived by the individuals. It is defined as the ability of a person to feel the same emotions as another. Individuals understand the situation and process the same emotions to produce the same response. Some argue that empathy is necessary in one's ethical values and that it is a "virtue" that can be partially influenced by external factors (Simmons, 2013). Empathy is essential in the relationships among students with food allergies because it indicates a higher level of understanding and social support. Zorza et al. (2015), a researcher focusing on neurophysiology and psychophysiology at the National University of Córdoba conducted a study which indicated that empathy impacted others' perception of the school climate(P-SC) with a correlation coefficient (r) value of 0.41. The "r" value can not exceed -1 or 1, indicating that this represents a moderate and positive correlation between these two factors. Although correlation does not determine causation, one can infer that empathy levels among one's peers has a positive relationship with school perception. According to a cross-sectional study analyzing 366 German students led by Pohling et al. (2015), for an aspect of empathy, empathic concern (feelings of sympathy towards other individuals in need), there was a correlation coefficient value (r) of 0.48 between it and personal values. This is a moderate positive correlation, indicating a relationship between these two aspects. This demonstrates that while other aspects may have some effects on individuals, one's personal values are the deciding factor for their level of empathy. External factors such as interventions may not have an impact on adolescent empathy levels regarding their peers' food allergies.

Psychological Effects of Food Allergies

Both food allergies and peers' empathy can impact the perceptions of the world among individuals with food allergies. A study led by van der Velde et al. (2009), a part of University of Groningen Medical Center and the Groningen Research Institute for Asthma and Copd. This study performs an in-depth analysis of the Food Allergy Quality of Life Questionnaire - Teenage Form (FAQLQ-TF) survey that is used for research purposes. The study analyzed responses from 101 individuals with a different questionnaire for each age group (children, adolescents, and adults). The range of these values go from 0-6, with six being where the food allergy disturbs one's quality of life the most. The results indicated that teenagers with at least one food allergy have a mean value of 4.40 when referring to FAQLQ-TF that was taken twice by each participant. The adolescent's mean value of 4.40 (merely 1.60 under the 6.0 maximum) indicates that food allergies negatively impact adolescent's quality of life. These individuals require support and empathy from others to mitigate the psychological effects, emphasizing the importance of empathy among peers regarding food allergies. According to a study led by Charles Feng et al. (2018), stress among adolescents with food allergies originates from intense avoidance of specific allergens and the level of bullying they experience amongst their peers and adults. The article mentions that adolescents ages 10-16 have higher anxiety and depression levels (no quantitative data for this was mentioned).

When a sample of twenty-five children ages 8-13 with food allergies were surveyed, two individuals had Post-Traumatic Stress Disorder (PTSD), while nine others were "subsyndromal" for this condition, further illustrating the negative impact of food allergies in young individuals. Another study was conducted which scored social support quality for students in grade levels eight through twelve using the Social Support Questionnaire (SSQ) on a scale from one to six, with six being the highest at "very satisfied." Regarding social support for adolescents, the mean value of social support quality was 5.34 in eighth grade and 5.41 in twelfth grade; the quality of social support was higher by 0.07, indicating that the quality of social support, especially empathy, is needed more in older children (Marshall et al., 2013). Clare Macadam et al. (2012), a part of the Academic Unit of Clinical and Experimental Sciences at the University of Southampton, published an article in the journal, Clinical and Translational Allergy. This article provided a questionnaire surrounding the attitudes of twenty adolescents ages 12-18 towards carrying their adrenaline auto-injectors. This was affected by the attitudes of their peers and whether their parent(s) or guardian carries the injector. One important aspect of this study is the attitudes of the peers regarding food allergies. If the adolescent has peers who have food allergies, then they are more willing to carry the auto-injector publicly. When peers do not care about food allergies, these individuals are not comfortable carrying the auto-injector because they are teased about their allergies. The scope of this poor treatment is emphasized in a study led by Andrew T. Fong et al. (2017), an individual in the School of Women's and Children's Health in the University of New South Wales. The study being conducted focused on the percentage of children who have food allergies in Australia that were bullied because of their food allergies by sampling the population with a 251 family cohort. The results of this survey indicated that 32% of children in Australia with food allergies were teased about their food allergies one or more times in their lives. Questionnaires containing questions pertaining to this topic were sent to these families in Australia. Since the high prevalence of teasing indicates a lack of seriousness regarding the situation, this information is useful to bring a sense of importance about the disregard concerning peers' food allergies.

Gap and Research Question

Previous research primarily focused on Quality of Life (QoL) levels among people with food allergies. Situational empathy among peers and the food allergies component of empathy has yet to be researched. Empathy must be increased among peers to improve the quality of life among adolescents with food allergies, which is the primary goal of this research. Previous research indicates that an increased level of empathy among other individuals can increase one's own positive perception about their lives and school. The peers of adolescents

with food allergies can have an impact by reacting in a more understanding manner to those who have food allergies.

This leads to the research question: Does the level of awareness among high schoolers about their peers' life-threatening food allergies impact their level of concern about how they handle food-related situations and conversations? A study which investigates the level of empathy about peers' food allergies through a survey and quasi-experimental method provided a conclusion by calculating empathy before and after information about food allergies was presented using a questionnaire.

Hypothesis

The alternative hypothesis (H_A) is that if adolescents ages fourteen to nineteen obtain information about food allergies and their severity, then their empathy levels will increase because they have an increased understanding about their peers' daily situations. For statistical analysis, the null hypothesis (H_0) was included: If adolescents obtain information about food allergies, then their empathy levels would remain the same because the information will not have an impact on their perceptions.

Method

A survey was conducted to determine if the level of awareness among high schoolers about their peers' life-threatening food allergies impacts their level of concern about how they handle food-related situations and conversations. The food allergies component of empathy and empathy among peers has never been researched regarding situations, so this was the focus of the inquiry.

The chosen method for this inquiry was a quasi-experimental method and survey because other forms of data collection would not have the potential to generalize the information to the population and a survey would be able to reach more participants in the targeted age group. The survey was distributed to adolescents ages 14-19 through social media platforms such as Snapchat and Reddit with groups such as r/Allergies, r/APResearch, r/Students, and r/highschool to collect data. Other forms of data collection such as interviews are specific to merely a few individuals and do not represent the views of the collective adolescent population. The quasi- experimental method determined if awareness about the effects of food allergies would impact respondents' empathy levels. This was accomplished through the implementation of the Interpersonal Reactivity Index (IRI), a questionnaire first established by Davis in 1983, which is widely accepted in the academic field for measuring general empathy levels. The information about food allergies that was provided to the participants was the independent variable as this is the factor that would supposedly impact empathy levels. Empathy was measured before and after the information was presented to see if there was a change from the presence of the independent variable, but the lack of a control group resulted in a quasi-experimental method. The dependent variable is the quantitative level of empathy as measured by IRI, which was altered to accommodate situational food allergies.

At the beginning of the survey, the participant identified if they have food allergies or knew another with food allergies. This was done to determine if the current condition regarding food allergies impacts their empathy levels. The IRI was obtained to measure the level of empathy among adolescents as it measures general empathy levels in twenty-eight questions under four subscales: Perspective-Taking (PD), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD), with seven questions for each subscale. PD refers to how stressed one becomes in intense situations, PT is how one places themselves in the positions of others, FS is how one places themselves in the positions of fictional characters, and EC is how much one cares for other less-fortunate individuals. Since the IRI measures general empathy, the questions were altered to become situational and accommodate the topic of food allergies among peers. For example, one of the positively-scaled EC questions from the IRI was "I often have tender, concerned feelings for people less fortunate than me." To put this

in the context of allergies, this question was altered to, "I often have tender, concerned feelings for people with food allergies." Rather than general information, the situational aspect of food allergies was included. One positively and negatively scaled question was provided for each subscale. Positively-scaled questions indicated higher levels of empathy for higher rated responses (1 = lower empathy / 5 = higher empathy). Negatively-scaled questions indicated lower levels of empathy for higher rated responses on the scale (1 = higher empathy / 5 = lower empathy). Participant's empathy was measured twice (before and after information was presented) so the IRI was shortened from twenty-eight to sixteen questions. Three questions were removed from each subscale in the IRI to minimize the survey's length.

These altered twenty-eight questions were divided into two groups with two positively- scaled and two negatively-scaled questions in each to make two distinct sets of questions that each measure empathy in a quantitative manner. This created sixteen questions in total and thus, ensured that the participants read the survey questions carefully because using the same rated response for each question would indicate a lack of consideration. A brief summary of information about the types of food allergies, their severity, and the impacts they have on individuals was included in the middle of the survey to determine if awareness had an impact on how much empathy an adolescent has towards another regarding their food allergies and thus respond to the research question. The responses were measured on a Likert Scale from one through five, with one representing "Does not describe me well" and five representing "Describes me very well" in relation to the participant. This represented a diverse set of responses, so the participant responded to the survey and conveyed their beliefs. At the end of the survey participant's demographic information (age, gender, grade level, and academics) was collected to determine if there was any representation bias in my survey. This will be determined by seeing if a larger proportion of respondents from a particular group participated more than others.

All survey questions were placed in Google Forms, a website dedicated to distributing surveys online and collecting responses (see Appendix A for complete survey). The link for the survey was easily sent out and reached many participants of the targeted age group (ages 14-19) in various secondary classrooms. QR codes were printed out for access to the survey through scanning on mobile devices with the heading: "Empathy and Peers' Food Allergies." The survey link was also sent through social media platforms such as Twitter and Reddit in groups such as "r/teenagers and r/Allergies" for adolescents with and without allergies because social media is a usual form of communication among the targeted population. The participants would be able to take this survey anytime they accessed it.

The survey results were analyzed by transferring them to Google Sheets and organizing all the responses into graphs and tables. For each subscale, the median of the responses on the Likert scale were calculated for each question. The average, or mean, was not used to determine the value for the scale because the average value for agreeing or disagreeing does not exist. A decimal value, which will result from the mean, does not have any significance regarding the context of empathy measurements. The median was used because a whole number was more data compatible for calculating empathy and the median score accurately represented the views of the population. Using these medians, the empathy scores were then determined. For positively-scaled questions, it would just be the median value. However, the median of the negatively- scaled questions would have to be subtracted by five to determine the empathy measurement because it was scored in reverse. Afterward, the average of the positively and negatively-scaled question for each subscale was calculated to find the empathy measurement for that subscale. The average for all the subscale measurements were completed to determine the final overall empathy measurement for the participants. The same process was repeated for the questions after the information was presented. The final empathy score was compared with the initial empathy score to determine if any changes in empathy occurred before and after information is presented. A Chi-square statistical analysis was then used to determine if the information was significant and if it truly had an impact on adolescent empathy.

Results

A survey was conducted to determine whether knowledge surrounding the food allergies of their peers would increase empathy levels among adolescents. Quantitative data was collected from 126 respondents regarding their perception of food allergies amongst their peers in addition to qualitative demographics. This is a smaller sample size and may not represent empathy across the entire adolescent population.

Table 1. Current Condition of Food Allergies among Participants

Participants	Food Allergies	No Food Allergies	Total
Peers with Allergies	21	79	100
Peers without Allergies	3	23	26
Total	24	102	126

Note. The data refers to the number of participants in each category.

To limit survey bias in collected data, the first question determined whether the participant had food allergies or if they knew another adolescent with food allergies. A total of 62.7% of participants did not have food allergies, but knew another adolescent ages 14-19 with food allergies (see Table 1). The primary goal was to collect more survey respondents who did not have food allergies, but knew another adolescent with food allergies. This would make empathy measurements to be determined solely based on the information about food allergies presented. The survey also determined that 18.3% did not have food allergies or knew another adolescent with food allergies while 16.7% had food allergies and they knew another adolescent with food allergies.
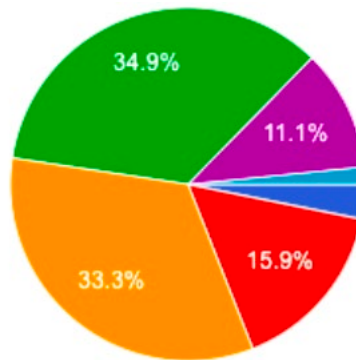

Figure 1. What is your Age in Years? Adolescents ages 14 (dark blue), 15 (red), 16 (orange), 17 (green), 18 (purple), and 19 (light blue) responded to the corresponding survey question (Google LLC, 2021).

Five demographic questions followed the empathy measurements to ensure that a diverse set of participants' responses were included in the study. Since the study focused on adolescents ages fourteen to nineteen, the first demographic question asked about the ages of the participants. The ages were fairly distributed, with 3.2% of respondents aged 14, 15.9% of respondents aged 15, 33.3% of respondents aged 16, 34.9% of respondents aged 17, 11.1% of respondents aged 18, and 1.6% of respondents aged 19 (see Figure 2). This indicates that there was no skewed data regarding the ages of participants. The data collected from these participants were focused on adolescents and thus, pertains to the inquiry. There was one participant who was 23 years of age, but since they did not fit into the targeted age group, their response was removed from data collection and analysis.
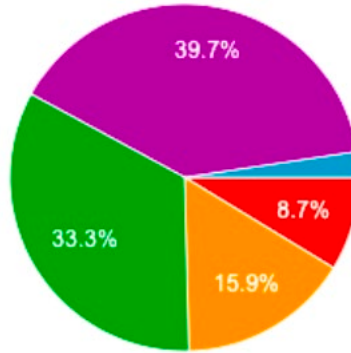
Figure 2. What is your Grade Level? Individuals in 6th-8th grade (dark blue), 9th grade (red), 10th grade (orange), 11th grade (green), 12th grade (purple), and post-graduates (light blue) responded to the survey (Google LLC, 2021).

The second demographic question focused on the grade level of the respondents. The grade levels were evenly distributed. There were no respondents who were in middle school (grades six through eight), indicating that the responses were from ninth grade and beyond (see Figure 3). Of the respondents, 8.7% of respondents were freshmen, 15.9% were sophomores, 33.3% were juniors, 39.7% were seniors, and 2.4% already graduated high school. This represents a wide variety of grade levels so there was no skew in this regard, indicating that all had similar levels of academic experience. This indicates that the respondents would have similar interactions with their peers of the same age group.
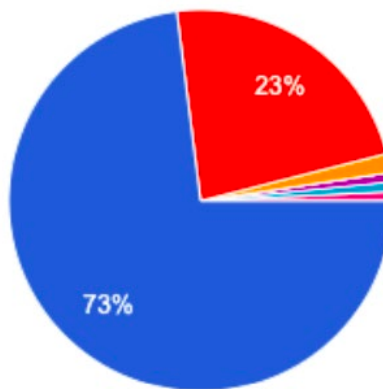

Figure 3. What Grades do you Typically Receive? Adolescents who predominantly receive A's (dark blue), B's (red), C's (orange), D's (green), F's (purple), A's and B's (pink), as well as grades that "depends on the class" (light blue) responded to the survey (Google LLC, 2021).

The third demographic question focused on the academic success of the participants as measured by the grades they receive from school. 73% of participants primarily receive A's, 23.8% primarily receive B's, 1.6% receive C's, 0% receive D's, and 0.8% receive F's (see Figure 4). The respondent who claimed they receive "a's and b's" were combined with the "B's" category because this is the lower grade they claimed to obtain, indicating they do not primarily receive A's. Many of the participants were high academic achievers so the data may be skewed to represent those with academic motivation, representing the views of those who want to portray higher empathy levels, thus impacting data collection. Social desirability bias could also be present as these individuals may want to portray themselves as intelligent.
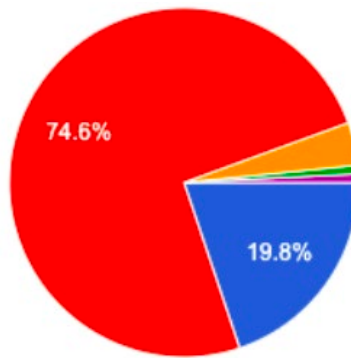
Figure 4. What is your Gender? Regarding gender, participants responded male (blue), female (red), non-binary (green), apache helicopter (purple), or "prefer not to say" (orange) (Google LLC, 2021).

The fourth demographic question discussed the genders of the participants to determine if there were any underrepresented groups. Females encompassed 74.6% of participants while only 19.8% of participants identified themselves as males. 0.8% identified themselves as non-binary and 4.8% preferred not to state their gender (see Figure 5). One participant claimed their gender was "Apache Helicopter." While removal of this response was considered, their other responses indicate that this participant took the other portions of the survey seriously, thus, their response to this question was transferred into the "Prefer not to say" category. The high percentage of female respondents demonstrates that empathy levels of females had more prominence over the data presented. However, both males and females can possess empathy so the data would not be significantly affected.
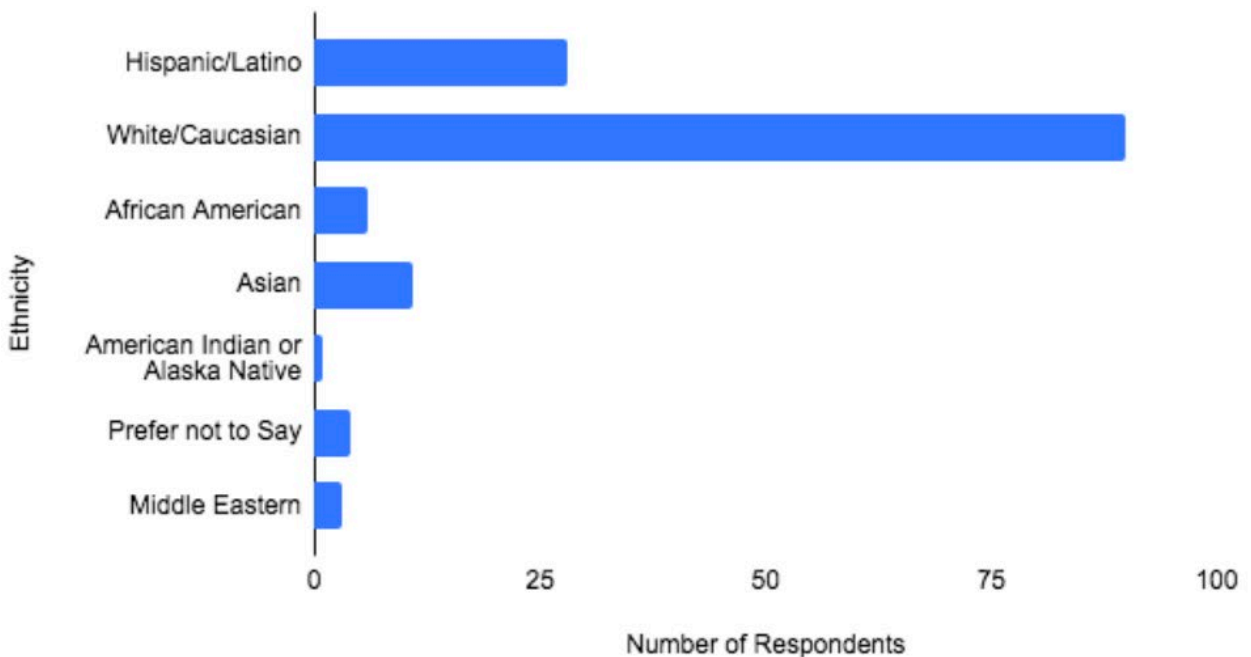

Figure 5. What is your Ethnicity? (Google LLC, 2021).

The final demographic question regarded the ethnicity of the participants to determine if some ethnic groups participated more compared to others because their empathy measurements would dominate the data

analysis. The responses indicated that 71.4% of participants were white/Caucasian, indicating the data may be mildly skewed to represent the views of more Caucasian individuals (see Figure 6). Regarding the minority groups, 22.2% were Hispanic/Latino, 8.7% were Asian, 4.8% were African American, 2.4% were Middle Eastern, 0.8% were American Indian or Alaska Native, and 3.2% preferred not to say their ethnicity. Underrepresentation of minority groups may have had an impact on data collection, but all ethnicities have the capability to empathize with others regarding their situations, preventing considerable influence.

The following eight questions in the survey were designed to measure the initial empathy measurements among the participants before the information was presented (see Appendix A for complete survey). These questions were constructed and altered from the Interpersonal Reactivity Index ("Interpersonal Reactivity...") created by Davis in 1983.

Table 2. Question Responses and Empathy Scores Before Information is Presented

Sub-scale	Scale	1	2	3	4	5	Median	Scores	Subscore
EC	+	18	17	35	25	31	3	3	3.5
	-	54	32	21	7	12	2	4	
PT	+	18	14	34	31	29	3	3	3.5
	-	49	33	23	12	9	2	4	
PD	+	29	30	40	17	10	3	3	3
	-	9	16	51	27	23	3	3	
FS	+	55	25	24	10	12	2	4	3.5
	-	29	9	26	22	40	3	3	

Note. The abbreviations for the subscales are Empathic Concern (EC), Perspective-Taking (PT), Personal Distress (PD) and Fantasy Scale (FS). "+" represents positively-scaled questions and "- " represents negatively-scaled questions. These questions and scales are derived from the IRI.

Once all the participants' responses were collected, the median of each question for each subscale was determined (see Table 2). Once the scores were determined for the positively and negatively-scaled questions in each subscale using the medians, the average of these scores within each subscale was taken to give the initial empathy measurement for that subscale. EC had a score of 3.5, PT was 3.5, PD was 3, and FS was 3.5. Empathy remained at approximately the same level across the four subscales, indicating that empathy from one subscale can be used to predict empathy levels in another. When taking the average of all these values to find the empathy score, it was 3.375, indicating a more neutral stance regarding initial empathy concerning their peers' food allergies.

Table 3. Question Responses and Empathy Scores After Information is Presented

Sub-scale	Scale	1	2	3	4	5	Median	Scores	Subscore
EC	+	11	8	28	39	40	4	4	2.5
	-	7	24	31	31	33	4	1	
PT	+	6	7	37	25	51	4	4	3.5
	-	29	29	36	15	17	3	3	
PD	+	17	24	39	35	11	3	3	3
	-	7	18	48	35	18	3	3	
FS	+	17	32	28	30	19	3	3	3
	-	19	21	49	13	24	3	3	

Note. The abbreviations for the subscales are Empathic Concern (EC), Perspective-Taking (PT), Personal Distress (PD) and Fantasy Scale (FS). "+" represents positively-scaled questions and "- " represents negatively-scaled questions. These questions and scales are derived from the IRI.

After the initial empathy measurement, information was presented to the participants regarding the scientific and emotional aspects of food allergies (see Appendix A). Following this information, a series of eight more questions followed to determine if there was a change in empathy levels after the information was presented. These questions differ from the initial ones at the start of the survey, but they still contain one positively and negatively-scaled question for each of the four empathy subscales. These different questions were implemented to ensure that the participants do not repeat their responses. The same process was followed to determine the empathy scores for each subscale and the overall empathy score. EC was at a score of 2.5, PT was 3.5, PD was 3, and FS was 3, providing the overall empathy measurement of three meaning neutral (see Table 3).
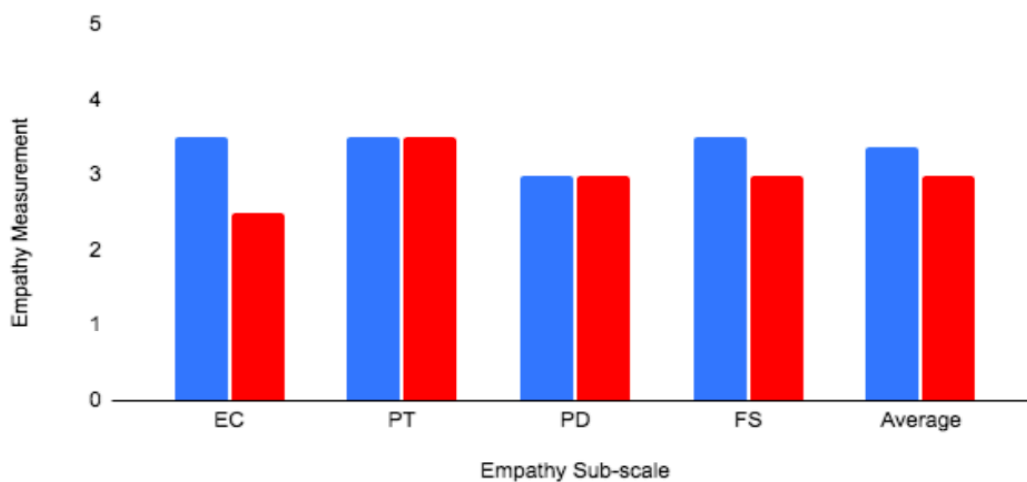

Figure 6. Empathy Score Comparisons in Sub-scales. Average empathy and empathy sub-scale scores were compared before (blue) and after (red) the summary of information was presented in the survey (Google LLC, 2021).

Overall empathy levels among adolescents regarding the food allergies of their peers experienced a slight decrease from 3.375 to 3 (see Figure 1). However, when a Chi-square analysis was conducted to determine the significance of these findings, the statistical analysis suggests that these findings failed to reject the null hypothesis (H_0), that information presented regarding the food allergies of their peers would not impact initial empathy measurements. Since there were four empathy subscales, there were three degrees of freedom (df), and the significance level (α) was 0.05 as that was the conventional value. When determining the critical value of the Chi-square analysis, these values were used to result in a critical value of 7.815. The expected values were the initial empathy measurements of each subscale because they were meant to support the null hypothesis that the empathy values would not change. The observed values were the final empathy measurements after the information was presented. When substituting these values into the Chi-square formula, $\chi^2 = \sum \frac{(O-E)^2}{E}$, $\chi^2 = 0.357$. Since $0.357 < 7.815$ and the Chi-square value was less than the critical value, this indicates that the findings failed to reject the null hypothesis. Understanding information regarding the impacts of peers' food allergies does not significantly influence empathy levels regarding the situation among adolescents.

Discussion

There are many adolescents with food allergies who experience increased levels of anxiety due to the carefree attitudes of their peers, which stems from a lack of empathy. In hopes of finding a solution to this problem, the results collected in this study determined if awareness among high schoolers regarding their peers' life-threatening food allergies impacted their level of concern about how they handle food-related situations and conversations. This research focused on the food allergies component of empathy and situational empathy, which has not yet been researched. The primary focus thus far in the field of psychology studied Quality of Life (QoL) levels among adolescents with food allergies and how increased empathy levels among peers can increase positive perceptions regarding their own circumstances.

Since the findings failed to reject the null hypothesis, one can reach the conclusion that information regarding food allergies does not change empathy levels among peers. This reflected the findings of Pohling's study (2015), that empathy levels among individuals are primarily decided by their personal values. Simmons' study (2013) also expanded on Pohling's by claiming that external factors can also play some role. This in combination with the results implies that external factors which influence one's personality should place more emphasis on empathy and the situations of other individuals. A mere paragraph regarding food allergies is not sufficient to increase empathy levels among adolescents. The importance of empathy and food allergies in an individual's life should be present throughout one's childhood and beyond to have an impact. The adults in an individual's life should express the impact of food allergies on individuals. If these influences are present, they could increase empathy levels among adolescents regarding their peers' food allergies and thus, improve their perceptions of food- related situations.

The conclusion derived from these results corroborated the findings of previous researchers. Fong's results (2017) observed that 32% of children in Australia were teased at least once due to their food allergies. This prominent level of teasing in Fong's study stems from a lack of sufficient empathy and the results of this inquiry demonstrate that empathy remains at around a neutral level of three out of the scale from one through five regardless of temporary awareness. This lack of empathy can contribute to increased bullying and poor confidence levels regarding an adolescent's own allergies. The average empathy levels observed in this inquiry will not provide adolescents with the support they need in higher grades, which connects to Zorza's findings (2015) that more support is needed during this time. As long as adolescents with food allergies do not obtain the support needed from their peers, they will continue to have van der Velde's observed poor perceived Quality of Life (QoL) levels. Since the results of this inquiry indicated that adolescent empathy levels regarding their peers' food allergies is difficult to change, it can also contribute to whether adolescents with food allergies carry their auto- injectors. Macadam's study argued that the adolescents who do not carry their auto-injectors do not have their peers' support. These effects are caused by a lack of empathy among the adolescent population.

Conclusion and Future Directions

A new understanding generated from these findings is that a paragraph of information regarding food allergies and their impacts is not sufficient to change empathy levels among adolescents ages 14-19 regarding their peers' food allergies. It can be concluded that external factors such as information only have minimal impacts on empathy because it is an innate value.

There were many limitations in this study that could have impacted the data collected. Since this survey was quasi-experimental, there was no control group to determine how empathy levels would remain if there was no information presented. Another limitation was self-reported survey bias. The respondents may have wanted to portray themselves as more empathetic, causing them to rate themselves with higher empathy levels on the Likert scale. The most significant limitation of my data were the attitudes of the participants regarding the survey format. Empathy remained at approximately the same level before and after the information about food allergies was presented due to annoyance. These adolescent respondents may have become irritated with

the fact that they had to read a paragraph, thus impacting how they responded to the subsequent empathy questions, resulting in skewed data.

Despite these limitations, it will be useful for future studies to determine if different age groups have distinct levels of empathy regarding the food allergies of their peers. Rather than merely focusing on empathy levels of adolescents, if the entire population was observed and divided into age groups, then it can be determined if the individuals with food allergies can psychologically benefit from interactions with the age groups that possess more empathy levels, thus improving their perceived Quality of Life.

Acknowledgments

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