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The Portrayal of Food Allergies in Children's Films

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Abstract

In childhood, perhaps more than any other time in life, fictional narratives, particularly in the form of television and movies, are a substantial form of influence. However, children's films can be a major source of misinformation for children and their parents alike. Despite the serious nature of food allergies, there are no studies that specifically investigate the presence of food allergies in children's films. Therefore, this prompted the question, how are the portrayals of food allergies in the top ten-grossing children's films that include a character with food allergies who experiences an allergic reaction during the film leading to misinformation about food allergies in children's lives? Through a mixed method content analysis, ten films that include a character with food allergies who experiences an allergic reaction during the length of the film, were evaluated over three viewings. During the film viewings, the researcher recorded data regarding the length of each reaction, how the reaction was triggered, the treatment of the allergen, key words surrounding the allergic reaction, and relevant characteristics about the character who experienced the reaction. Specifically, when it came to the treatment of allergic reactions, 5 out of the 13 (38.46%) allergic reactions were met with no treatment. Furthermore, treatment varied, including the administration of an Epinephrine Auto-Injector (Epi-Pen), administration of an unknown shot, a makeshift emergency tracheotomy while waiting for professional medical treatment, leeches, and professional care by a hospital medical team. An abundance of data revealed that, as a whole, children's films that include a character with food allergies generally oversimplify the condition with unrealistic symptoms and a lack of medical care. Films that contain inaccurate portrayals can further spread misinformation and negatively alter a child's understanding of food allergies; however, the films that accurately portray characters with food allergies have the potential to be used as an educational tool.

Keywords: Food allergy, Children, Films, Movies, Portrayal, Misinformation

1. Introduction & Contextual Information

Throughout history, food has been an essential source of nutrition and a critical tool to bring people together. For children, the age group from birth to 12 years of age, food is a doorway to social interactions, celebrations, and growing up. However, children who have food allergies can experience isolation and exclusion. According to Kristina L. Newman of the Psychology Department at Aston University School of Life and Health Sciences, "Food allergy (FA) is classified as an adverse reaction to ingestion of certain foods, with prevalence of FA as high as 10%. Adolescents and young people with FA are the age group that has the highest frequency of fatal reactions due to serious allergic reactions" (Newman et al., 2022, p. 1). Despite the severity of food allergies and the critical need for accurate education surrounding anaphylaxis, misinformation surrounds food allergies and the individuals affected by this intense hypersensitivity.

In today's culture, the majority of misinformation stems from the media, mass communication meant to inform or influence, more specifically "the visual culture [that] becomes dominant in almost every field of life [which] impacts…the children's psychology, their perception of the reality and their relationships" (Şentürk, 2011, p. 1121).

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Children are especially impressionable and although social media and smartphones may not be the largest source of media influence for their age group, television and film play a major role (Zurcher et al., 2019).

Children's films can be defined as films that are rated G and PG by the Motion Picture Association of America (Wahl et al., 2003). Evaluating the impact of children's films is multifaceted as appeals and characters present in children's movies are vastly different from those present in films targeted at adult audiences. Jessica Zurcher, an Assistant Professor in the School of Communications at Brigham Young University, led a study evaluating the messaging within Disney animated films where she preliminarily found that "99% of homes contain at least one television with children watching approximately 4 hours of television daily…children aged 8 to 12 years old spend approximately two and a half hours watching TV/DVDs/videos daily..." (Zurcher et al., 2019, p. 130). This frank data illustrates the urgency for accurate portrayal of food allergies and allergic reactions in children's films, as this age group "may rely heavily on television as they form attitudes, beliefs, and perceptions" (p. 130). Accordingly, television programs that spread misinformation surrounding food allergies are not innocent forms of entertainment, they can be the difference between a child treating an allergic reaction seriously or facetiously. Furthermore, as Rachel Gehman of the Department of Psychological Science at the University of Vermont and her associates, proved, the "moral content" of stories in general, and therefore children's films, can impact children's subsequent behavior (Gehman et al., 2021, p. 3). However, these films often contain "a complex structure" that makes it difficult to categorize them completely (Şentürk, 2011, p. 1127). Although the overall rating ensures the appropriateness of movies, these films do not necessarily have consistent portrayals of important topics in areas such as the field of health and they can even spread contradictory information and promote unadvisable behaviors. This is essential to consider when evaluating the portrayal of food allergies in children's movies, as children and their families may experience an "impaired quality of life" as they manage symptoms of allergic reactions, avoiding anaphylaxis, and the potential burden of treatment and medical costs (Dhanjal et al., 2023, p. 2). Therefore, films containing characters with food allergies must avoid proliferating inaccurate messages that lack medical backing to avoid adding to the burden of those living with food allergies.

However, despite patterns of misportrayal in children's movies that have created misinformation across the food allergy community, this topic has not been evaluated in depth. Therefore, this prompted the question, how are the portrayals of food allergies in the top ten-grossing children's films that include a character with food allergies who experiences an allergic reaction during the film leading to misinformation about food allergies in children's lives? More specifically, to answer this research question, two sub-questions will be analyzed: how are allergic reactions portrayed in children's films and how are characters with food allergies represented in children's films?

As this research began, it was clear that to understand how food allergies are portrayed in children's films, there must be a solid understanding of the impact that a food allergy diagnosis has on children and their families, the overall awareness of food allergies among children, and the significance of children's films on youth development.

When analyzing research from a diverse range of sources, a prevalent theme emerged regarding the lack of support for a child and their family after a food allergy diagnosis, especially among a child's peers. Ranjit Dhanjal - the Vice President of marketing, communications, and engagement at Food Allergy Canada - and her team studied the effect of Allergy Pals, "an online, peer-to-peer" (p. 1) educational program for children 7 to 11 years of age and their parents. The research team found a connection between high competence and elevated confidence in living with food allergies (Dhanjal et al., 2023). While Allergy Pals was found to be effective in connecting children and their families with a peer support system, it is important to note that alternative online forms of support, such as forums on Reddit, do not currently provide relevant, fact-based information, and can result in decreased confidence and understanding of living with food allergies. Dhanjal references the rise of social media as a source of misinformation surrounding food allergies, as well as the "inappropriate portrayal of food allerg[ies]" across the digital world, notably in television and movies (p. 5), all of which can negatively impact food allergy management.

This is especially important to address for people who have limited working knowledge of what it is like to live with food allergies. Although this category of people accounts for a diverse, large sum, a sizable portion of the uninformed population includes children and adolescents (Timothy et al., 2019). Whether because of a lack of overall education surrounding food allergies or the factor of age, which has not allowed them to encounter the aforementioned condition, children can be particularly susceptible to misinformation or ignorance surrounding a myriad of ideas or

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conditions, including food allergies. The children who live with this hypersensitivity are well aware of the potentially life-threatening repercussions that can come from consuming or being exposed to an allergen, but this concept can be difficult to communicate to uneducated or misinformed peers.

A study conducted by Kristia L. Newman of the Psychology Department at Aston University School of Life and Health Sciences investigated the beliefs about food allergies among adolescents aged 11 to 19 years old who have been diagnosed with a food allergy (Newman et al., 2022). Regardless of their older age, these teens attest to the residual lack of understanding surrounding food allergies in their peers. Newman found that some of the surveyed adolescents "experienced discrimination," exclusion, and belittlement because of their food allergies (p. 9). Overall, the teens pointed to their peers "needing education and information to increase understanding" (p. 9). The issue of faulty education regarding food allergies begins with children and subsequently extends to adolescents, causing a myriad of difficulties that are only complicated by the rise of technology in the lives of young people of all ages.

It is important to pinpoint where children's misinformation originally stems from, to correct the lack of knowledge. As noted previously, Ranjit Dhanjal of Food Allergy Canada credits digital platforms for deception in food allergy education, and Veronica Graham of the Royal Children's Hospital and her co-researchers, agree. This group set out to "identify sources of, and gaps in, nutrition information and services used by parents of children aged between four and six years and their kindergarten teachers" (Graham et al., 2000, p. 1). Both the surveyed parents and kindergarten teachers cited "popular media," from "television [to] radio and magazines" as a source of nutritional information (p. 4). Furthermore, at the time of this study, which was at the start of the age of social media, "The National Health and Medical Research Council ha[d] identified the media as one of the most potent influences in our society" (p. 4). Therefore, when analyzing potential gaps in nutritional information, it is reasonable to infer that media, in the form of television, films, and more, represents a flawed resource surrounding the wider knowledge of nutrition, especially food allergies. Therefore, media, and specifically children's films for younger audiences, can contribute to spreading false ideas and discouraging children with food allergies.

Similarly, Monique Wonderly of the Department of Philosophy, University of California at Riverside, argues that narratives portrayed in children's films can be effective "tools" for education surrounding morals, behavior, and empathy (Wonderly, 2009, p. 7). This approach, though, can be a double-edged sword, as these movies can present negative, unauthentic characters or storylines that children may identify with, therefore furthering poor behavior and inaccuracies. Although characters with food allergies are not extremely abundant in children's films, these films and characters have not been analyzed. However, some individuals have taken the concept of evaluating the quality of food allergy depiction out of the sphere of children's films, and into the realm of online videos posted to YouTube.

Keerthi Reddy of the Department of Pediatrics at East Tennessee State University, and a group of her peers, performed searches on YouTube to yield the most frequently viewed videos surrounding "food allergy" and "food allergies" from various users (Reddy et al., 2018, p. 411). After watching these videos, the research group categorized and rated each video based on the presence of misleading information versus accurate information, the quality of the video, and its overall comprehensibility. Overall, Reddy found that "food allergy videos on YouTube were a poor source of food allergy health information" (p. 413). This conclusion was based on the discovery that over a quarter of the videos contained misinformation and ineffective diagnosis/treatment examples, which mirrors the work of the aforementioned Veronica Graham. This research provides a basis for investigating misconceptions in media concerning food allergies that extend to the world of children's films.

Wendy E. Hovdestad, a psychologist in Ottawa, Canada researched "unwanted personal contact and risky situations in ten Disney animated feature films" (p. 111) and concluded that "the possibility that children's learning about personal safety could be impaired makes this a fruitful area for further research" (p. 124). This concept is a clear reason to expand upon the research of professionals, such as Keerthi Reddy, who have already begun analyzing the portrayal of food allergies in popular media. However, while the analysis done on this topic has been restricted to platforms such as YouTube, no investigations have explored food allergy representation specifically within the field of children's films. Therefore, providing a new understanding to this field is extremely valuable and may lead to increased safety for those living with food allergies.

There is great variety in the field of research surrounding movies made for young audiences; from focusing solely on Disney films to looking at films that contain certain portrayals like parental roles, anxiety, and mental illness,

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research on children's films and media is abundant. Likewise, there is a vast array of research pertaining to children and their families navigating food allergy diagnosis and management. Some of the research includes analysis of mentor programs, misinformation in the media, and overall awareness of food allergies among adolescents, children, parents, and other adults. There is also further research involving how to develop "a food allergy curriculum for parents" (Vargas et al., 2011, p. 575) and how to implement accurate education "on food allerg[ies] and anaphylaxis in the school setting" (Poza, & González, 2021, p. 1). These studies represent an important area of research in the field of food allergy safety, as well as proving that the exploration of food allergies in children's lives has been heavily studied in many specialized niches.

Therefore, although there is ample research regarding children's films and food allergies separately, there is no research that specifically connects food allergies and children's films by analyzing the portrayal of characters with food allergies in children's films. It is known that media, and more specifically, movies, can have a significant impact on children (Zurcher et al., 2019). Additionally, it has been proven that children, teens, and even adults are improperly educated about food allergies and their severity (Newman et al., 2022). Consequently, studying food allergies in children's films fills a major gap as this topic has not been studied in-depth and it addresses relevant safety concerns, such as bullying and lack of awareness, circulating misinformation in the food allergy community.

2. Methodology

It is crucial, for valuable, unbiased data to be gathered, that a mixed sampling method, providing both quantitative and qualitative data, is utilized when choosing and evaluating the films in this content analysis research. A sampling method means that the movies selected for this body of research will be chosen based on specific criteria. A grounded theory, which is employed when the general principle connecting films is unknown or when a researcher wants to find the prevalence of something within a certain group of films, could be useful in a future study. However, the number of films that include a character with food allergies and an allergic reaction is small, because food allergies are not extremely common in children's films. The point of this research is not to assess the prevalence of food allergies and allergic reactions in children's films, as a grounded theory would provide; this information is already established. Therefore, a sampling method allows the actual portrayal of food allergies in children's films to be the focus of the analysis. To gather the information necessary from this study, each of the top 10 grossing children's films (G or PG rating) that include a character who is identified as having food allergies *and* experiences an allergic reaction during the film (to ensure that there is enough data to analyze how food allergies are portrayed in children's films), will be preliminarily viewed once. Although there are more than 10 films that meet this study's criteria, analyzing the top 10 grossing films allows the subsequent data to be substantially more valuable, as the top 10 films in this category have had the most audience support and viewership. Therefore, these 10 films have the largest scope of influence, especially among children, so their food allergy portrayals are the most important to assess. The 10 films that will be analyzed include: *Cloudy with a Chance of Meatballs*, *Godmothered*, *Meet the Robinsons*, *Nancy Drew* (2007), *Paul Blart: Mall Cop 2*, *Peter Rabbit*, *Puss in Boots: The Last Wish*, *The Box Trolls*, *The Game Plan*, & *The Smurfs 2* (listed in alphabetical order). These films were determined to meet the aforementioned criteria by accessing the information available on the Internet Movie Database, specifically the gross statistics under the "Box Office" heading, and spokin.com, "a trusted, solution-based resource providing…tools all with the common goal to make it easier, faster, and safer to manage food allergies" (Spokin, 2023), including the largest comprehensive list of food allergies features in movies and television.

These 10 films will be watched, in alphabetical order, for a primary viewing, where the run time of each film, the distribution of the film length into three sections (beginning, middle, and end), the number of allergic reactions present (at least one allergic reaction will be present, based on the initial criteria, but there could be multiple), and character(s) who experience the allergic reaction(s) will be noted. From here, each film will be rewatched for a second time, using a table and guiding criteria to take notes and record important data pertaining to food allergies throughout the film. The second viewing will document specifics about the allergic reaction(s) including: the time(s) of the allergic reaction(s) and what section distribution this falls under, the length of the reaction(s), what food triggered the immune response(s), the type of contact with the allergen, what treatment was given, if the reaction(s) was/were explicit or

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implicit, if the food allergy was previously known or unknown, keywords used to describe the food allergy/reaction, and the resolution.

After this data is gathered to fully understand the allergic reactions, the third viewing will be completed in which specific information about the character with food allergies will be gathered. The data gathered will include, character status (protagonist, antagonist, a family member or friend who is close to the protagonist, or additional side character), keywords used to describe the character by others, approximate age, gender, occupation, observable weight (overweight vs. normal weight vs. underweight), and notable accessories.

By observing the allergic reaction(s) present as well as how these events correspond to the character with food allergies, a detailed picture of how food allergies are portrayed in children's films will be painted. Concerning the research question and two sub-questions, I hypothesize that allergic reactions in children's films will be portrayed in a comedic light without much variety throughout the body of films. Specifically, I hypothesize that most of the allergic reactions will be triggered by the same allergen in several movies, lacking variety. In terms of the allergic reactions themselves, I hypothesize that a pattern of exaggerated symptoms will emerge over the ten films and that characters will not receive the medical attention they need; I believe this pattern will contribute to a general trend of these films promoting inaccurate information about allergic reactions that is not medically sound. Finally, to address the second sub-question, I hypothesize the majority of the characters will be seen as outsiders or weak individuals, which their food allergies will contribute to, although this is certainly not true of real life individuals who have been diagnosed with food allergies.

3. Results

3.1 Quantitative Results

Based on the initial inclusion criteria, each of the ten films included in the study was determined to include at least one allergic reaction; still, in the primary viewing, the number of allergic reactions was recorded for each film. Two of the ten films included more than one allergic reaction: *The Boxtrolls* and *The Game Plan*. While this data is related more closely to the prevalence of food allergies in children's films, to fully assess the portrayal of food allergies in these films, the number of allergic reactions in each film is an important component to note. Overall, in the ten films analyzed, there were 13 allergic reactions. During the primary viewing, each film's run time was divided into three equal sections. The time of each of the 13 allergic reactions was recorded in the second viewing, along with the corresponding section each reaction fell into, to better contextualize the part of the movie where the allergic reaction occurred. The average recorded length of an allergic reaction was 2 minutes and 7.92 seconds. The longest-recorded allergic reaction was 9 minutes and 45 seconds in *The Smurfs 2* and the shortest-recorded allergic reaction was four seconds in *Puss in Boots: The Last Wish*. Looking more specifically at the allergic reactions themselves, over half of the reactions (61.54%) were triggered by ingesting the allergen, while the rest were the result of topical contact (38.46%). 10 out of the 11 characters included in this study were previously aware of their food allergy before coming in contact with it during the film.

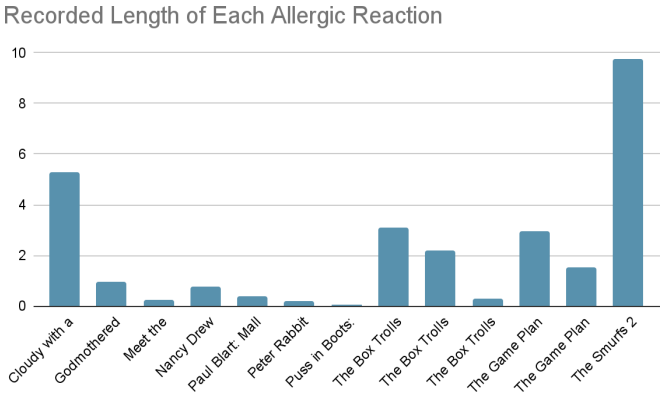

Figure 1. Bar graph visually representing the recorded length of each of the 13 allergic reactions discussed in the study.

Moreover, when it came to the treatment of allergic reactions, 5 out of the 13 (38.46%) allergic reactions were met with no treatment, although this resulted in mixed outcomes, with some characters dying as a result (Puss from *Puss in Boots: The Last Wish* and Archibald Snatcher from *The Boxtrolls*) and other character's symptoms diminishing over time with no lasting effects (Joe Kingman in *The Game Plan*). In terms of the central research question, this quantitative

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data, which is specific to the allergic reactions themselves, is essential to understanding the misinformation as a result of the portrayal of food allergies in children's films as it provides specific data to bring a new understanding to the numerics of allergic reactions. After the primary and secondary viewing, the third viewing was completed, which focused on quantitative data about the character who experienced the allergic reaction.

Out of the eleven characters who experience an allergic reaction throughout the ten films in this study, three characters (27.27%) were classified as protagonists, three characters (27.27%) as antagonists, two characters (18.18%) as family members or friends who are close to the protagonist, and three characters (27.27%) were classified as additional side characters. Out of these individuals, four (36.36%) of the characters who experienced an allergic reaction were female and seven (63.63%) of the characters who experienced an allergic reaction were male. All but one of the characters were human; Puss, the protagonist in *Puss in Boots: The Last Wish*, is a British Shorthair cat. Eight characters (72.73%) were classified as adults of various ages (including Puss in Boots, who is on his 9th cat life and is understood to be over age 18), while three characters (27.27%) were classified as children of various ages, including Trish (*Nancy Drew* (2007)), who is approximately 17 years old, Peyton Kelly (*The Game Plan*), who is eight years old, and Johnny "Peanut Kid" (*The Smurfs 2*), who is approximately five years old. Finally, taking the eleven characters as a whole, zero characters (0%) were considered underweight, ten characters (90.91%) were considered normal weight, and one character (9.09%) was considered overweight (Archibald Snatcher from *The Boxtrolls*).

The quantitative component of this mixed method study is key to allowing each of the ten films, and the portrayal of food allergies they present, to numerically contribute to understanding how food allergies are portrayed in children's films.

3.2 Qualitative Results

The second and third viewings of each film provided valuable qualitative data, as well as the aforementioned quantitative results. The most common food allergy in the ten films was a nut allergy, with five characters experiencing a reaction as a result of a nut allergy, and four of the five characters specifically identifying their allergy as peanuts. The second most common allergy was shellfish/seafood, as two characters were identified as having a shellfish and/or seafood allergy (Eleanor from *Godmothered* and Puss from *Puss in Boots: The Last Wish*). The rest of the allergens included oatmeal, blackberries, cheese, and cinnamon. These foods were each only a trigger for an allergic reaction for one character.

Regardless of the allergy or whether the contact with the allergen was ingestion or topical, an overall trend emerged that similar symptoms resulted during each reaction throughout the ten films. For example, Sam Sparks (*Cloudy with a Chance of Meatballs*), who is allergic to peanuts, experiences an allergic reaction due to peanut brittle touching against her left arm (topical contact). As a result, Sam experiences symptoms such as, immediate sustained severe swelling of the left arm (where allergen initially made contact), face, and lips. Oppositely, Puss (*Puss in Boots: The Last Wish*), who is allergic to shellfish, experiences an allergic reaction due to consuming a dish visibly containing clams and shrimp (ingestion). Consequently, Puss experiences symptoms such as, sustained swelling of the face, especially on the right cheek, hives around the mouth, and right eye swollen shut. These two characters have completely different allergies and they come into contact with their allergen in two separate ways. Still, both Sam Sparks and Puss sustained swelling of their face and particularly intense swelling in the area where the allergen made contact. It should be noted that even though Puss is a cat and Sam Sparks is a human, they both experienced similar, if not very much the same, symptoms, which furthers the emerging pattern. This trend can be seen across the study, with some type of swelling being a common symptom in most of the allergic reactions that were analyzed.

When it came to treating symptoms of an allergic reaction or anaphylaxis, there were several approaches. Treatment varied, including the administration of an Epinephrine Auto-Injector (Epi-Pen), administration of an unknown shot, a makeshift emergency tracheotomy while waiting for professional medical treatment, leeches, and professional care by a hospital medical team. Relevant keywords used by characters to describe the food allergy and allergic reaction were recorded throughout the movie, with most comments being circumstantially grounded and focused on the allergic reaction itself. Some characters responded in bewilderment or surprise, such as Lewis (*Meet*

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the Robinsons) who asked "What's happening?" in response to Mr. Harrington experiencing an allergic reaction. Oppositely, Nancy Drew (*Nancy Drew* (2007)) used her emergency medical protocol training to effectively respond to an allergic reaction at her birthday party. When she encountered Trish, a girl from her school, unconscious on the ground, Nancy asked, "Does she have any food allergies?" It was discovered that Trish is allergic to peanuts and her reaction was due to topical contact with a peanut cookie. While others are disturbed and frantic, Nancy proceeds calmly, asking for "a knife and a ballpoint pen," which she uses to open Trish's airway until the ambulance arrived. The third viewing of each film also provided notable keywords, but this trial focused on keywords that described the character who experienced the allergic reaction. Generally, these keywords corresponded to the character status of each individual; for example, protagonists generally had the most words or phrases describing their character, and these words included positive phrases such as, "You did well" (Keyword describing Eleanor from *Godmothered*).

Excluding minors, Puss (*Puss in Boots: The Last Wish*), and Mr. Harrington (*Meet the Robinsons*), all of the characters, regardless of character status, had an occupation. Some character's occupations were not stable throughout the whole movie, such as Thomas McGregor (*Peter Rabbit*). Thomas began the movie employed as the Toy Department Manager at Harrods of London, although he quit twice during the movie, with the second time being his official resignation. Eleanor Bloomingbottom (*Godmothered)* had a unique occupation as a Fairy Godmother in Training. For some characters, their occupation contributed to the notable accessories that distinguished their character throughout the movie. For example, Vincent Sofel (*Paul Blart: Mall Cop 2*), the leader of a gang of art thieves, wears a blue suit and matching light blue tie throughout the film, contributing to his professional and intimidating presence, which is necessary to direct his accomplices.

4. Discussion

4.1 Findings

After the completion of the film study, the overall research question regarding the portrayal of food allergies in children's films was answered through the thorough investigation of the two guiding questions.

Initially, regarding the first sub-question, I hypothesized that allergic reactions would be portrayed in a comedic light. With no previous studies analyzing children's films and food allergies, there was no targeted work to build hypotheses; I used background knowledge of the appeals used in children's films and recognized that humor is a popular technique used to connect with young audiences. Therefore, I assumed allergic reactions would be seen as a joke used to get young viewers laughing. In reality, this assumption was largely incorrect. In several films, characters expressed serious concern over the reaction that was occurring and some characters rushed to find medical help. While Maya Blart (*Paul Blart: Mall Cop 2*) and Peter Rabbit and his family members (*Peter Rabbit*) took advantage of a food allergy to hurt the antagonist, these characters did not respond to the situation with humor. Therefore, that hypothesis was disproved, but a new layer of complexity surrounding the reaction of characters to allergic reactions was gained. While the exploitation of food allergies to harm a character is neatly tucked into the plot progression of *Paul Blart: Mall Cop 2* and *Peter Rabbit*, this portrayal can promote concerning behavior and substantial misinformation among children as their lives are not a movie; food allergies should not be touted as a weapon against any individuals.

Furthermore, the food allergies represented in the ten films held more variety than I had initially expected. I hypothesized that there would be a lack of variety of allergens throughout the films, but this was not entirely correct. Qualitative data found that there was more than one character with a nut allergy and more than one character with a shellfish/seafood allergy, but there were also characters with miscellaneous allergies. Overall, while the nut allergy and the shellfish/seafood allergy were repeated and other allergens such as eggs or soy were not represented at all in the ten films, the presence of six different allergens overall proved that a complete lack of allergen variety was not present. The portrayal of allergens should be diversified in the future to be more realistic, but the results for these ten films were better than expected.

Quantitative results found that over one-third of allergic reactions were not treated at all and over half of the characters did not seek professional medical attention. As a result, two of the characters succumbed to their symptoms.

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These results supported my hypothesis that characters would not receive the medical attention they need to resolve their allergic reaction. Moreover, the pattern of exaggerated symptoms that I hypothesized emerged, particularly in the four animated movies out of the ten film sample. An extreme example is *The Boxtrolls* when Archibald Snatcher's stomach explodes as a result of eating cheese and he dies. This is just one example of exaggerated or unrealistic symptoms that support my preliminary hypothesis.

Finally, before research began, I believed that the majority of the characters who experienced allergic reactions would be seen by others as weak or awkward. As I gathered information about each character, I found that the eleven characters were fairly balanced in their character roles. A very similar number of characters were classified as a protagonist, antagonist, family member or friend who is close to the protagonist, or as an additional side character. If the majority of the characters in the study were antagonists or additional side characters, they would likely be seen as evil or insignificant. This was not the case in this study. Several characters made sweeping character arcs, transforming their disposition from the start to the end of the movie. Sam Sparks (*Cloudy with a Chance of Meatballs*) is a notable example, as she was initially seen as a nerdy weather enthusiast, before becoming a popular local reporter who helps to save the town of Swallow Falls. Other characters such as Puss (*Puss in Boots: The Last Wish*), Eleanor (*Godmothered*), and Joe Kingman *(The Game Plan*) are seen as heroes. Some characters were viewed unfavorably in the film, such as Archibald Snatcher (*The Boxtrolls*) who was a social outcast in the town of Cheesebridge. This example partially proved my hypothesis that characters with food allergies would be seen as weak outsiders, but the several characters who are viewed positively disproves my assumption that a majority of characters would be framed in a feeble, eccentric light. Overall, these portrayals generally combat the spread of misinformed attitudes towards individuals with food allergies; this condition does not make a person awkward or weak, but quite the opposite, as the heroic, determined characters illustrate.

4.2 Limitations

The ten films analyzed in this study do not account for every children's film that includes food allergies; this analysis only accounts for the top ten grossing films from the United States and Canada. Therefore, other lower-grossing films could contribute additional information to the data gathered in this study. These ten films provide a basis of information to reflect the larger group of movies that include food allergies.

Likewise, although quantitative data is included in this study, qualitative data was also an important part of this mixed-method study, meaning that my personal observations of allergic reactions and the appearance of characters were part of the data. I strove to maintain a high level of objectivity, but it is possible to interpret behavior in different ways, so another researcher may see an allergic reaction from a unique perspective and add details that I did not record in this study.

4.3 Areas for Future Research

This research provides the first connection between food allergies and children's films, nevertheless, this field is plentiful for future research. While the data gathered through this film analysis looked specifically into components of each movie and its relevant characters, more information can be gathered by collecting data from children who these films are aimed at. This direction is multifaceted, as children's movies are made for all types of children to enjoy. Gathering first-hand information from children regarding their reactions to food allergies in children's films would effectively further explore how these movies contribute to children's understanding of food allergies. A questionnaire administered before and after each film could be used to determine how watching a film with a character who has food allergies impacts a child's concept of this health condition. A similar procedure could be explored with a group of children who are all diagnosed with a food allergy themselves. These children would be able to speak to the relatability of the characters they see on the screen and how accurate they feel the character's experiences with a food allergy are to real life. Furthermore, to understand the broader portrayal of food allergies in films, a film analysis could be conducted including movies of all ratings, to explore the similarities and differences between food allergy portrayal in films rated G, PG, PG-13, and R.

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4.4 Implications

While a few films included in this body of research represent food allergies inaccurately or encourage unadvisable activities, some films have risen to the top throughout this analysis as portraying food allergies in a positive, factual manner. Films such as these, which include an educational component, can be used to help children who have food allergies understand their diagnosis and stay safe. Children frequently relate to and admire characters from their favorite movies, and even go so far as imitating their actions. Accordingly, accurate portrayal of food allergies in children's films can be utilized as a teaching tool to help young audiences understand how to treat a friend with allergies or what to do if they experience a reaction themselves. These films may be able to teach children valuable lessons, such as carrying an Epi-Pen, which could be life-saving.

Furthermore, in the future, directors, producers, and writers of children's films that plan to include food allergies may choose to consult experts on the best way to portray this serious health condition as they begin to understand the broad negative patterns of misinformation that inaccurate portrayals contribute to.

5. Conclusion

During the completion of this film analysis, much of the documented data can be found directly within each of the ten films. Although it required attention to detail, recording information such as keywords used to describe each character did not call for any personal interpretation. Oppositely, to record the symptoms of each allergic reaction, I was frequently left to painstakingly analyze each scene that included a reaction to accurately and objectively determine the symptoms a character was experiencing. At times symptoms were obvious, but in other cases, I had to intentionally dissect a character's appearance and behavior to pinpoint symptoms such as manic behavior or a subtle breakout of hives. It was a challenge to record this information precisely, especially since I completed this film analysis individually without corroborating my results with any peers. However, this process was greatly aided by the fact that I have personal experience with allergic reactions as I have lived with a food allergy to dairy and nuts since I was a young child. Consequently, I am familiar with some adverse reactions that can occur as a result of consuming an allergen, so I know the proper vocabulary that is used to describe symptoms of anaphylaxis. I had to be careful to not infer to a large extent about the symptoms a character was experiencing, but overall, this research process was certainly supplemented by my personal knowledge of food allergies.

Moreover, while exploring the portrayal of food allergies, each film provided an abundance of data. This information was initially difficult to interpret and trace patterns through. Regardless, the evidence that was gathered is valuable to bringing the misinformation that stems from the portrayal of food allergies in children's films to light.

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