

Article

Arts-based approach to describe the perceptions of spiders by local people

Rael S. Manriquez¹, Mark Anthony J. Torres^{1,2,3}, Cesar G. Demayo^{1,2,3}

¹Department of Biological Sciences, College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines

²School of Interdisciplinary Studies/Institute of Peace and Development in Mindanao, MSU-Iligan Institute of Technology, Iligan City, Philippines

³Center of Integrative Health, Premier Research Institute of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines

Email: rael.manriquez@g.msuiit.edu.ph, cgdemayo@gmail.com, torres,markanthony@gmail.com

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Abstract

People's perceptions of spiders can vary from disgust to fascination, which has a substantial impact on the value People's perceptions of spiders can range from disgust to fascination, and these perceptions significantly impact how they value the conservation of Aranea. This study employed an arts-based methodology to explore the perspectives of 123 respondents from Talenceras, Bohol, Philippines, towards spiders. Data collection involved spider drawings and interviews with participants. The findings unveiled people's diverse relationships with spiders, including their role in controlling problematic insect populations. While humans appreciate spiders for their pest control abilities, they also view them as a source of entertainment, particularly in the context of spider derbies, which pose a significant threat to female spiders. Demographic data indicated a growing number of young people engaging in spider-related entertainment without realizing they might encounter pregnant female spiders. Some individuals fear spiders due to concerns about their potential toxicity, leading them to avoid contact with these arachnids. Negative perspectives toward spiders, mainly if people are unable to distinguish between spider species, could hinder conservation efforts. This study emphasizes the importance of taking proactive measures to address these spider-related issues and protect biodiversity.

Keywords Aranea; attitudes; perspectives; conservation.

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1 Introduction

Human perception is a complex phenomenon influenced by various factors, and it significantly shapes our understanding of different objects and situations (Carbon and Jakesch, 2013). Our interactions are influenced by internal and external factors that contribute to our impressions. External factors encompass motion, novelty,

salience, shape, and size, while internal factors include attitudes, emotions, expectations, knowledge, intentions, and values. Consequently, we interpret things differently (Wachinger et al., 2012; Kenyon & Sen, 2014), leading to diverse conclusions. Given our uniqueness, there are instances where the perceptions of others may influence our own. Such situations include peer groups, where individuals react to each other's behavior and share cultural knowledge within a community (Knowles et al., 2001; Miragoli et al., 2018).

Our perceptual system's general specifications and processing quality also contribute in shaping our perception (Nagel, 1974). Even when the stimuli we receive are incomplete, they still allow us to form opinions based on our preferences and emotional influences, ultimately determining whether our perspective leans toward positivity or negativity (Kenyon and Sen, 2014; Carbon, 2010a). According to Jacobs (2009, 2012; Hicks and Stewart, 2018), wildlife can be a potent emotional stimulus for humans. Individuals' emotional reactions to animals are heavily influenced by historical perspectives, assumptions, and life experiences crafted by their cultures (Castillo-Huitron et al., 2020; Hicks and Stewart, 2018). Interactions with large predators, reptiles, and arachnids often evoke anger, contempt, and fear. Human judgments about nature are frequently driven by emotions and perceived threats, leading to the local extinction of numerous species (Slovic and Peters, 2006; Bombieri et al., 2018). However, the intensity of these negative emotional responses varies depending on the conservation status of the species. Threatened or endangered species evoke more robust emotional responses than less endangered ones (Prinz, 2004; York and Longley, 2017), positively impacting their conservation efforts. Several studies (Michalski and Michalski, 2010; Lemelin and Yen, 2015; Hauke and Herzig, 2017; Mammola et al., 2017) have demonstrated that humans have strong emotional reactions to spiders, often leading to a distorted perception of risk, particularly concerning spider bites. Even though only 0.5% of spider species are capable of causing severe envenomation in humans (Hauke and Herzig, 2017), the public's perception of the danger posed by spider bites tends to be skewed towards the potential harm spiders can inflict on humans. Notably, no deaths attributed to spider injuries have been reported in recent decades (Nentwig and Kuhn-Nentwig, 2013; Nentwig et al., 2013; Stuber and Nentwig, 2016). According to Gore and Knuth (2009) and Hathaway et al. (2017), these emotions stem from the victim's exaggerated assessment of perceived risk. Additionally, Knight (2008) and Gerdes et al. (2009) suggest that these feelings may have psychological origins linked to our ancestors' fear of venomous creatures, while Davey (1994), Merckelbach (1996), and Davey (1998) propose cultural influences. Although spiders inhabit virtually every terrestrial ecosystem (Turnbull, 1973; Wankhade et al., 2012; Bonte et al., 2002), including indoor environments (Bertone et al., 2016), the likelihood of being bitten by a dangerous spider is generally low (Diaz & Leblanc, 2007). These theories prompt the question of why contemporary societies have such a distorted perception of danger (Lemenlin and Yen, 2015). In this study, we employ art-based research and Herbert Blumer's symbolic interactionism theory to investigate various strategies for biodiversity conservation. This theory explores three hypotheses: 1) The meaning attributed to objects influences human behavior; 2) We assign value to things based on our social interactions and experiences; and 3) The meaning of symbols is dynamic and evolving. These hypotheses will shed light on the significance and meaning of spiders within the community of Talenceras. Consequently, this study aims to understand how individuals perceive spiders and to assess the impact on conservation efforts, with a specific focus on the following objectives: (1) Collect and analyze people's perceptions of spiders using artistic methods; (2) Collect spiders from the research area and compare these findings with existing literature to assess the accuracy of beliefs regarding each taxon; (3) Conduct descriptive statistical analysis to identify factors influencing people's perceptions of spiders. The significance and symbolism attributed to species, as well as individuals' perceptions of them, can have substantial implications for conservation efforts. Biases in perceptions may perpetuate prejudice against specific taxa, posing challenges to their conservation. Conversely, if perceptions link species to prosperity,

longevity, and enjoyment, it could benefit conservation endeavors. Therefore, understanding how people perceive spiders and whether these perceptions affect conservation efforts is crucial, particularly for a taxonomic group as ecologically essential as spiders. Spiders, the focus of this research, often face negative portrayals as frightening and harmful in the media.

2 Methodology

2.1 Area of study

The study was conducted in Talenceras, Tubigon, Bohol, situated on the eastern part of the island at coordinates 9°55'40" N and 123°59'05" E (see Fig. 1). Due to its rural location, surrounded by hills, pastures, and abundant vegetation, this area's primary mode of transportation is the 'Habal-habal' motorcycle ride. Many of the locations in Talenceras are not accessible by car. Most of its residents are engaged in farming, including raising cattle and cultivating crops to support their families. As of the 2020 Census, Talenceras had a population of 789 inhabitants, constituting approximately 1.65% of its municipality, Tubigon.

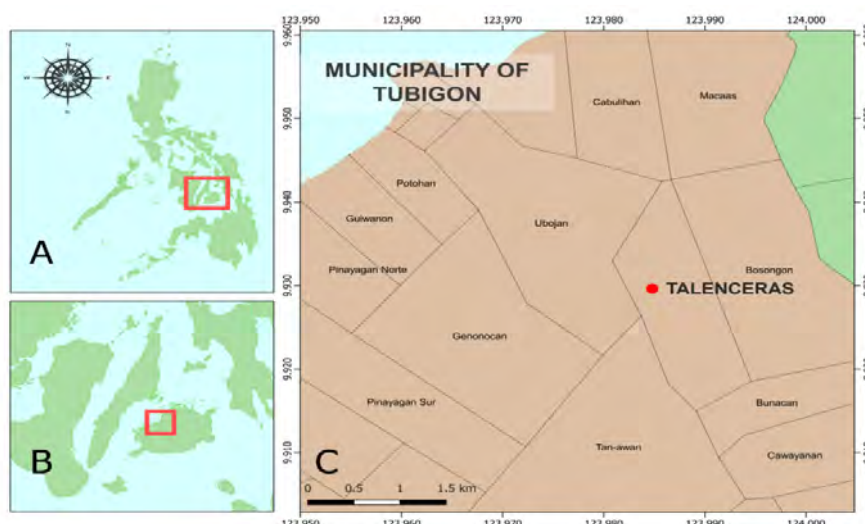


Fig. 1 Map showing the Philippines highlighting Central Visayas (A); Central Visayas is highlighting Municipality of Tubigon, Bohol province (B), and (C) Barangay Talenceras, the sampling site.

2.2 Surveying and sampling

The study was conducted between May 2021 and February 2022, marked by the COVID-19 pandemic, which presented unique challenges for qualitative research. The virus disrupted social norms and behaviors unprecedentedly, making data collection challenging. Additionally, concerns about infection and transmission led to hesitancy among potential participants, further complicating the research process. To adapt to these circumstances, specific data were collected using social media platforms like Facebook Messenger to circumvent face-to-face interactions. However, it is worth noting that a significant portion of Talenceras' residents lacked internet connectivity. Therefore, a face-to-face questionnaire approach was employed with strict adherence to safety protocols as a precautionary measure.

The study employed a convenience sampling approach and utilized a structured questionnaire in Cebuano and English to accommodate all participants. Before responding to the questionnaire, participants were explicitly asked for their consent, with an assurance that the research was solely for academic purposes and that all personal data collected would remain confidential. The questionnaire consisted of several sections,

beginning with basic demographic information, including name, age, highest educational attainment, and religion. In the first question (Q1), participants illustrated their initial thoughts when they heard the word 'spider.' Subsequently, two questions (Q2-Q3) sought to explore the meaning behind their illustrations, followed by two questions (Q4-Q5) inquiring about their personal experiences. Lastly, two questions (Q6-Q7) delved into their thoughts and sentiments regarding the subject.

2.3 Analysis

Thematic analysis at interpretive levels assessed and interpreted each narrative dataset, offering quantitative and qualitative insights. The analysis encompassed the following levels: 1). Descriptive Analysis: This level generated generic descriptions of situations, events, and objects within the narratives; 2). Linguistic Analysis: It delved into the use of metaphors and symbolism in language, exploring the linguistic nuances employed by participants in their narratives. 3). Conceptual Analysis: This level explores the narratives' underlying ideas, meanings, and existential considerations. It aimed to identify overarching concepts and complementary meanings. The collected data were organized into meaningful quantitative units, themes, concepts, and associated meanings. The frequency of occurrence for each theme was subsequently determined, offering insights into the themes that are significant to the participants. This process allowed for a qualitative assessment of the relative relevance of each theme. Additionally, quantitative data underwent examination for descriptive statistics using IBM SPSS version 26.

2.4 Collecting, identifying, and validating spiders

The collection occurred along a 1.8-kilometer route between Talenceras and Bunacan, from Purok 1 to Purok 7. To capture spiders, vial tapping and opportunistic sampling techniques were employed. Various habitats, including bushes, shrubs, tree litter, and trees, were thoroughly examined for the presence of spiders. Once collected, each spider was placed in a bottle containing 95% ethanol for preservation, and after 12 hours, they were transferred to another vial with 95% ethanol for long-term storage. Identification of the spider species was carried out using keys, illustrations, and descriptions sourced from Barrion and Litsinger (1995), Smith (2006), Barrion-Dupo (2008), and Whyte and Anderson (2017). Subsequently, the collected spiders were assessed using existing literature to determine the accuracy of perceptions associated with each taxon.

3 Results and Discussion

Out of the 123 individuals interviewed, the demographic breakdown is as follows: Women comprise 36.7% of the participants, with Roman Catholicism being the predominant religion at 89.5%. In terms of education, 30.3% have completed junior high school. The largest age group is 13 to 19 years old, making up 31.9% of the participants. For a detailed overview, please refer to Table 1, which summarizes the participant's demographic data.

Table 2 displays the emerging thematic trends from the thematic analysis, with the most common perception being that spiders serve as pest control agents, followed by themes related to entertainment involving spiders (such as spider derbies), beliefs in spiders solely benefiting the environment, support for spider conservation, the notion that spiders are confined to their webs, recognition of spiders as sentient creatures, perceptions of spiders as pests, varying perceptions influenced by spider bites, beliefs in spiders' lethality, fear of spiders, views of spiders as venomous, contrasting perceptions shaped by media and appearance, recognition of additional benefits beyond environmental impact (e.g., economic and pharmaceutical), keeping spiders as pets for collection, beliefs in spiders residing in trees and leaves, tendencies to eradicate spiders upon sight, beliefs that spiders cannot survive without their webs, recognition of spiders as non-dangerous creatures, individuals gaining income from spiders, and the belief that spiders only attack in self-defense.

Table 1 Demographic profile of the participants.

		n	%
Age group	6-12	25	21
	13-19	38	31.9
	20-26	16	13.4
	27-33	14	11.8
	34-40	8	6.7
	41-47	6	5
	48-54	5	4.2
	55-61	3	2.5
	62-68	3	2.5
	69-75	0	0
	76 and above	1	0.8
Gender	Male	44	36.7
	Female	76	63.3
Religion	Roman Catholic	94	89.5
	Born Again	7	6.7
	Baptist	3	2.9
	Iglesia ni Cristo	1	1
Education	Kindergarten	1	1
	Elementary	25	25.3
	Junior High	30	30.3
	Senior High	16	16.2
	Vocational	2	2
	Tertiary	25	25.3

Table 2 Frequency and Percentage of Themes.

	N	%
Pest control agent	90	73.17
Entertainment	48	39.02
Good for Environment	32	26.02
Conservation	26	21.14
Web as home	25	20.33
Sentient	23	18.7
Pest	20	16.26
Bitten (+)	20	16.26
Lethal	16	13.01
Bitten (-)	14	11.38
Fear	14	11.38
Venomous	12	9.76
Media/appearance (+)	11	8.94
Media Appearance (-)	8	6.5
Benefits	8	6.5

Pet	6	4.88
Reside in trees/leaves	5	4.07
Eradication	5	4.07
Can't survive w/o Web	5	4.07
Not dangerous	4	3.25
Money	4	3.25
Defense mechanism	2	1.63

3.1 Perceptions of people towards spiders

Webs as home (Fig. 2)

Many illustrations portray the commonly held belief that webs serve as the primary abodes of spiders. They perceive these webs as the dwelling places of spiders. While this notion holds partial truth, it does not encompass the whole picture. A spider's web is a tool for ensnaring insects and prey (Nentwig et al., 2022). Spiders diligently reconstruct their webs each night to maintain their stickiness for prey capture. Another noteworthy characteristic is that female spiders construct well-known orb webs (Sherman, 1994; Venner et al., 2000; Théry and Casas, 2009). Furthermore, it is important to note that not all spider species create the same type of web as depicted by the participants.

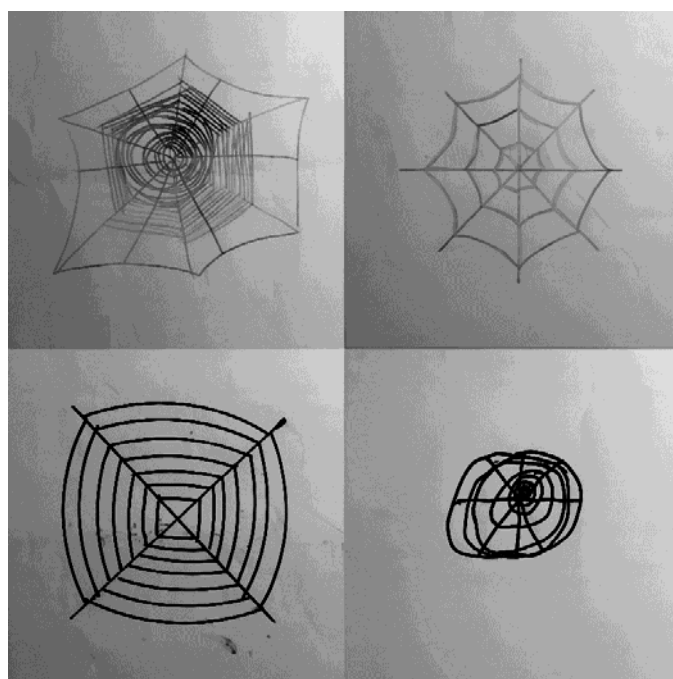


Fig. 2 Participants' drawing of Web as home.

Venomous (Fig. 3)

One of the factors contributing to people's fear of spiders is that 9.7% of survey respondents described them as repulsive. When individuals encounter a spider, they often instinctively perceive it as a threat, potentially dangerous and lethal. However, the truth behind this perception is more intricate, as some spider species pose a risk while others do not. Additionally, modern antivenoms have been developed to effectively treat spider bites (Isbister et al., 2003; Isbister, 2004; Hauke, 2017).

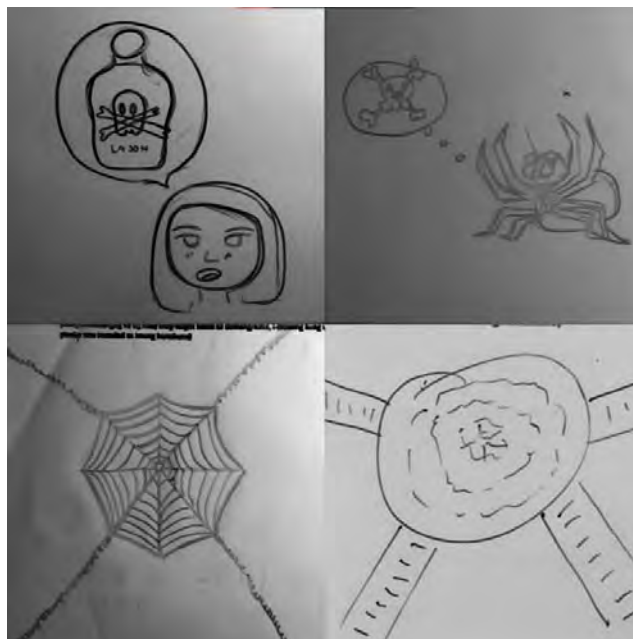


Fig. 3 Participants' drawing of Venomous.

Pest control agent (Fig. 4)

Seventy-three percent (73%) of the participants illustrated spiders capturing their prey in webs, with the most prevalent depiction showing spiders as natural pest controllers. The majority of respondents asserted that mosquitoes were the primary prey of spiders. Moreover, spiders typically feed on insects and other spiders, supplementing their diet occasionally with non-spider prey and even plant material to enhance their arthropod-based nutrition (Nyffeler and Birkhofer, 2017).

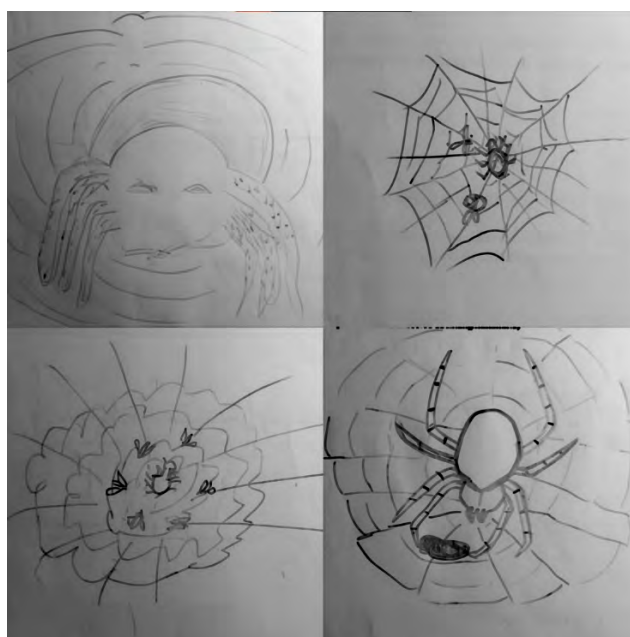


Fig. 4 Participants' drawing of Pest control agent.

Entertainment (Fig. 5)

Approximately 39% of the participants depicted the spider derby in their drawings, either because they had participated in it or found it enjoyable. The arachnid derby is considered a pastime due to its affordability and minimal equipment requirements. Some individuals reported training their spiders for these events by engaging them in sparring matches with smaller spiders or by providing them with dextrose or *Moringa oleifera* (kalamungay) leaves to enhance their endurance and strength for competition (Barrion-Dupe, 2008; Pepito, 2018).

Notably, participants in spider derbies often have limited knowledge regarding the gender of their spiders. However, female spiders have certain advantages in such competitions, including greater muscular mass and swifter movement than males. Female spiders expose their webs at night, making them more accessible for capture and use in the derby.

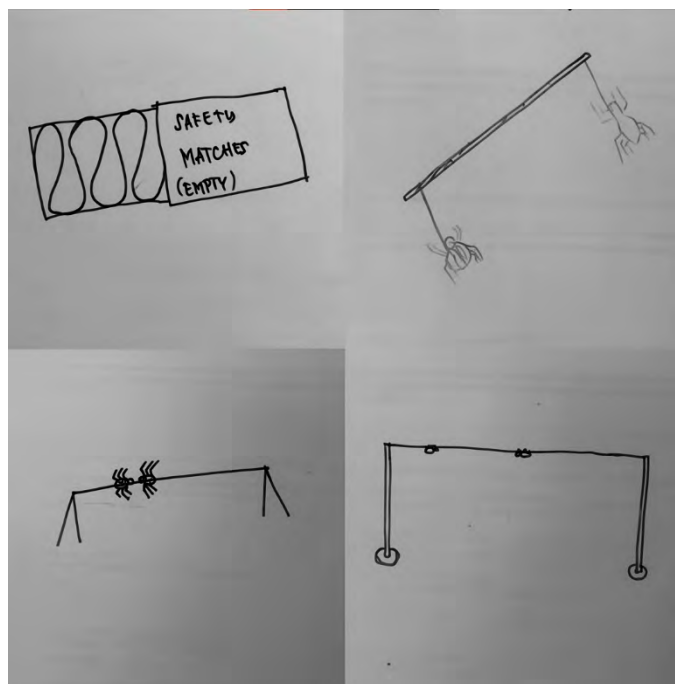


Fig. 5 Participants drawing of Entertainment.

Sentient (Fig. 6)

According to 18.6% of the survey respondents, spiders are considered sentient beings. They should not be captured for amusement, as they are believed to possess families and emotions and are seen as part of God's deliberate creation. Philosophers and arachnologists have engaged in ongoing debates, yet a conclusive resolution still needs to be discovered. An individual's personal beliefs, compassion, respect, and cultural background all play pivotal roles in influencing their acceptance of the idea of spider sentience (Preece, 1997).

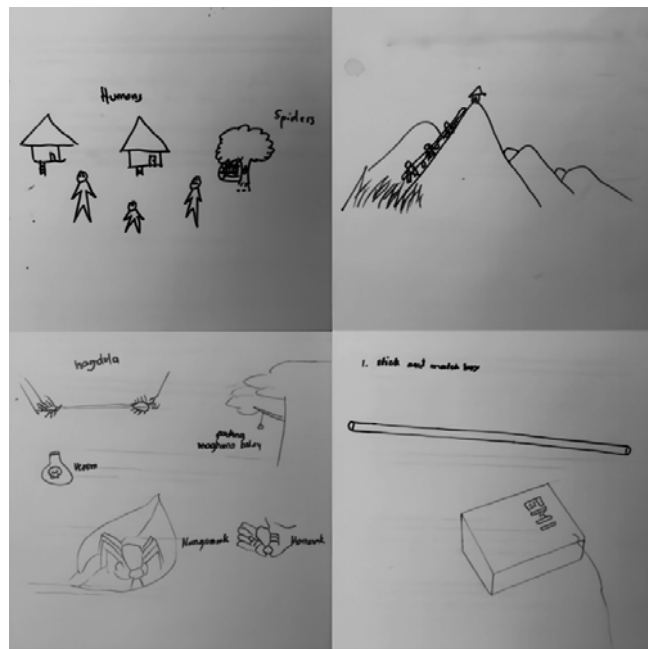


Fig. 6 Participants' drawing of Sentient.

Good for environment (Fig. 7)

Spiders and their webs frequently feature in the participants' drawings, often serving as a means for them to express themselves. However, these artistic representations align with the participants' acknowledgment of spiders' crucial role in ecosystems, particularly in safeguarding crops against insect pests. A study by Mansour and Whitecomb (1986) underscored the substantial positive impact of introducing spiders into areas plagued by crop pests, leading to improved crop health and growth and reduce pest pressures.

It is worth noting that spiders offer an environmentally friendly alternative to chemical pesticides, positioning them as effective biological control agents (Debach and Rosen, 1991; Barrion and Litsinger, 1995).

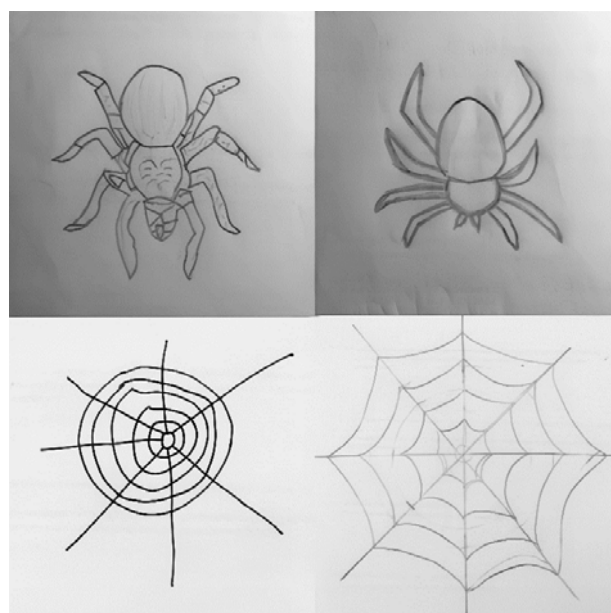


Fig. 7 Participants' drawing of Good for the Environment.

Pest (Fig. 8)

Among the most ubiquitous creatures globally, spiders are generally found in virtually every corner of the Earth. They inhabit diverse ecosystems, including deserts, rainforests, tundra, and aquatic environments. Spiders are known for their ability to craft intricate webs, whether in trees, buildings, or caves. Moreover, numerous spider species have adapted to various geographical regions (Diaz and Leblanc, 2007). It is important to acknowledge that the presence of spiders can occasionally result in the formation of unsightly webs, as depicted by some participants. These webs can diminish the visual appeal of homes, buildings, and other structures. Among the various spider species, orb-weaving spiders are notorious for creating such unattractive webs.

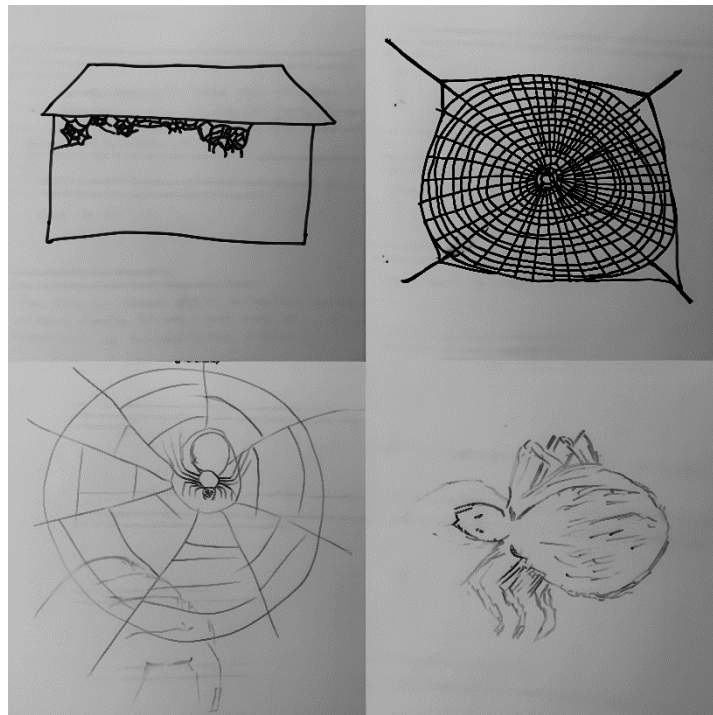


Fig. 8 Participants' drawing of Pest.

Bitten (+) (Fig. 9)

Most participants reported experiencing spider bites, with 16% indicating that these encounters led to the development of empathy toward spiders after understanding their ecological importance. Their perception of spiders' significance has transformed. Participants now recognize that beyond adding to the natural beauty of our environment, spiders play a crucial role in curbing the population of harmful insects. Regardless of the diversity in the participants' artwork, a common thread emerges: their encounters with spider bites have contributed to positive personal changes.

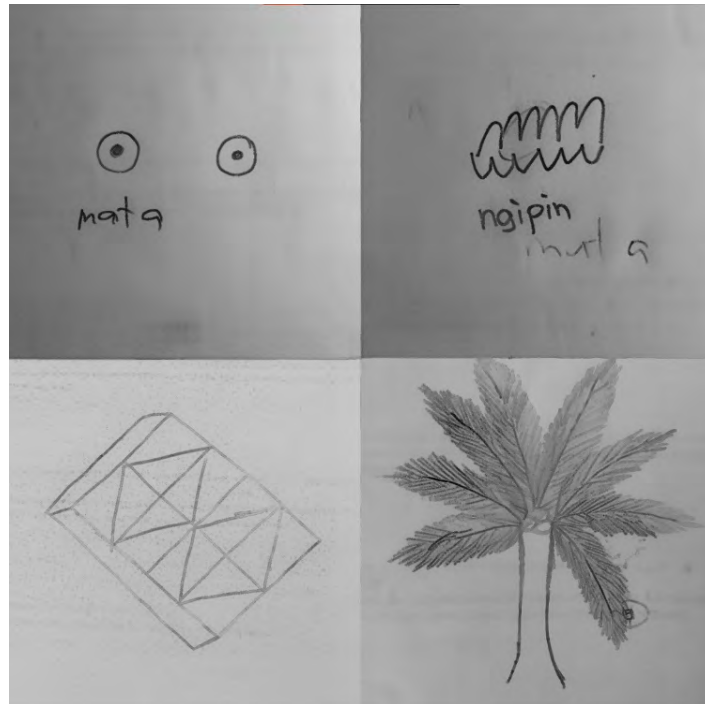


Fig. 9 Participants' drawing of Bitten (+).

Bitten (-) (Fig. 10)

Spider bites are viewed unfavorably by 11.3% of individuals who have experienced them, often leading to feelings of illness. One participant depicted a web belonging to the Genus *Argiope*, often called 'Mr—X,' known for its venomous reputation. Nevertheless, research has established that the venom of *Argiope* spiders, while present, is not harmful, especially to humans (Friedel and Nentwig, 1989).

Additionally, there have been numerous incidents related to spider bites; regrettably, the majority of these cases automatically attribute blame to the spider without specifying the species or even confirming if it was indeed a spider involved (Mammola et al., 2020; Hauke and Herzig, 2017). In reality, only a minute fraction of spiders, approximately 0.5%, are considered dangerous. However, it is worth noting that young individuals are more commonly affected by allergic reactions resulting from spider bites (Hauke and Herzig, 2017; Isbister, 2004).

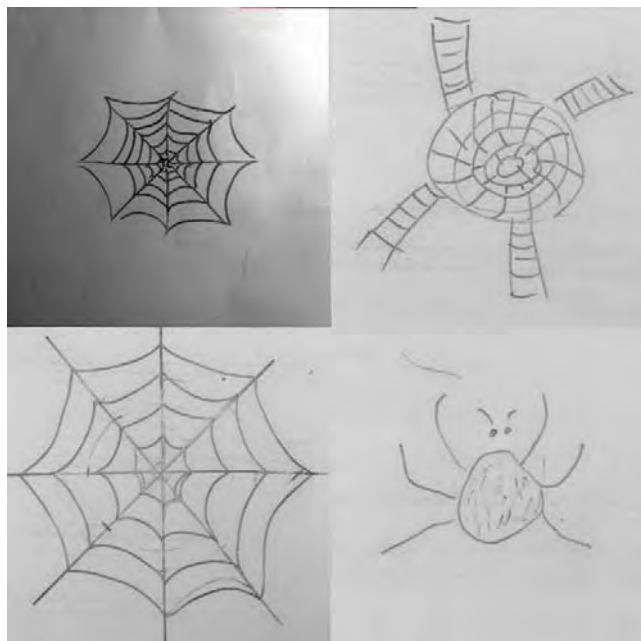


Fig. 10 Participants' drawing of Bitten (-).

Not dangerous (Fig. 11)

Approximately 3.2% of respondents argue that spiders have minimal impact on people due to their manageable size and ease of capture, as depicted in the drawings. This perspective is grounded in several factors, including their relatively small size, the absence of venoms that affect vertebrates, and their secretive lifestyles. In most cases, spiders cannot inflict severe envenomation on humans, a viewpoint that holds some validity. Even among the rare spider species capable of producing more potent venoms, the resulting symptoms are typically localized and mild (Hauke and Herzig, 2017).

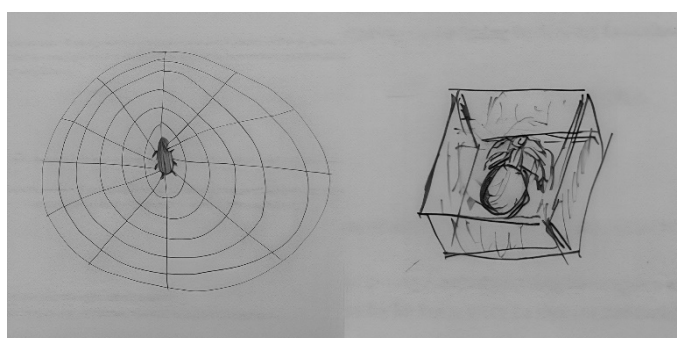


Fig. 11 Participants' drawing of Not Dangerous.

Lethal (Fig. 12)

The fact that 13% of the participants perceive spiders as aggressive, harmful, and potentially deadly holds significance. One participant even recounted a near-death experience due to a spider bite, albeit with some exaggeration. It is worth noting that young infants often exhibit more severe envenomation symptoms, likely owing to their lower body weight and underdeveloped immune systems. However, as individuals mature, the effects of envenomation tend to become less significant (Bucaretschi et al., 2000; Bucaretschi et al., 2014).

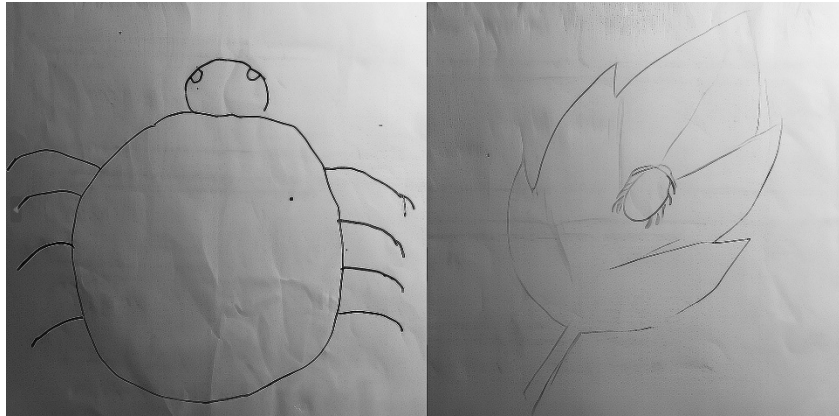


Fig. 12 Participants' drawing of Lethal.

Reside in trees/leaves (Fig. 13)

Permanent residents of trees and foliage. This portrayal supports the nocturnal nature of most spiders, as they tend to be more active during the cooler night hours, reducing their risk of predation. Typically, spiders spend their daytime hours concealed within leaves or other protected hideaways before emerging at night. This behavior is a deterrent to diurnal predators, primarily active during daylight hours. However, it is worth noting that certain spider species opt for subterranean burrows for both rest and hunting purposes (Nentwig et al., 2022).

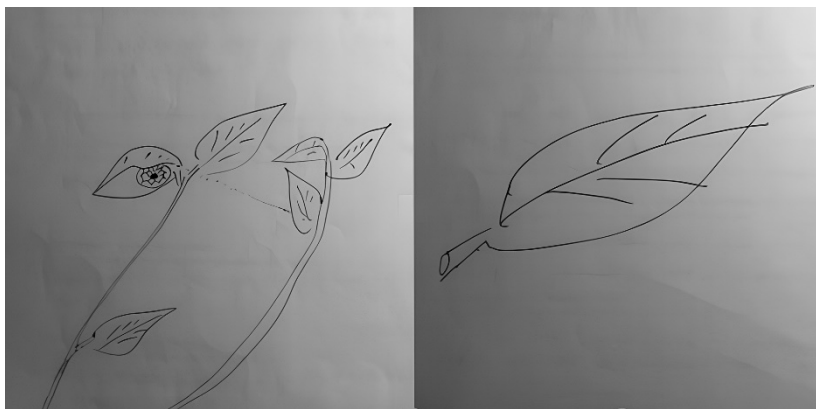


Fig. 13 Participants' drawing on: Reside on Trees/Leaves.

Eradication (Fig. 14)

As portrayed in the drawings, 4% of the participants perceive spiders as pests and find their appearance repulsive, leading them to kill spiders on sight without hesitation instinctively. Such behaviors might be rooted in ancestral instincts to protect themselves from potentially venomous creatures and a survival trait passed down through generations. Consequently, some individuals harbor a dislike for spiders (Knight, 2008; Gerdes et al., 2009).



Fig. 14 Participants' drawing on Eradication.

Media/Appearance (+) (Fig. 15)

Based on the depictions in the participant drawings, 8.9% of individuals hold a positive view of spiders, appreciating them for their intricate webs and other unique characteristics. This admiration may also be influenced by media, primarily through the popularity of Spiderman movies. Respondents have long been fascinated by spiders' remarkable construction abilities. For instance, spiderwebs have been employed to develop optimized fiber orientation reinforced composite structures used in the aviation sector for crafting pressure vessels, fuselage cones, and shell structures (Regassa et al., 2021).

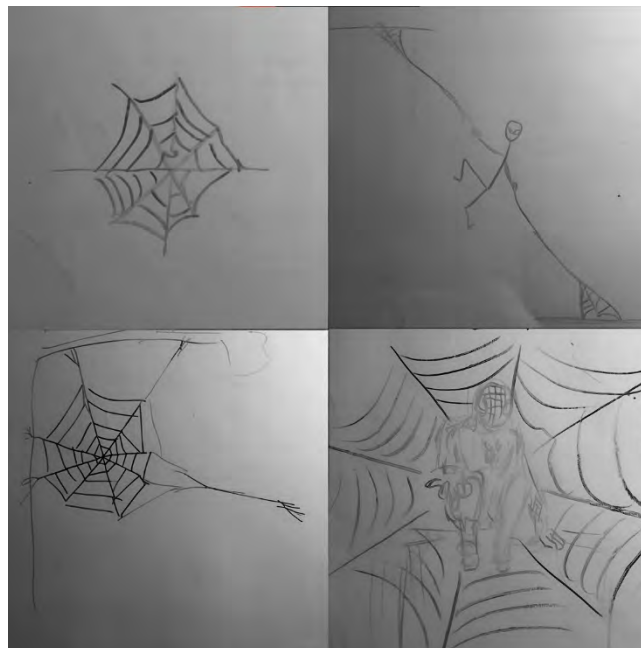


Fig. 15 Participants' drawing on Media/Appearance (+).

Media/Appearance (-) (Fig. 16)

Hollywood films often portray and reinforce spiders as formidable antagonists or monstrous creatures, significantly shaping people's perception of them. As a consequence, 6.5% of the participants view spiders

with a sense of disgust and fear. Furthermore, many news stories about spiders tend to exaggerate or contain inaccuracies, particularly when shared on social media platforms, leading to widespread misconceptions about these arachnids. Consequently, these factors collectively influence how people perceive spiders and may decrease overall tolerance towards them (Mammola et al., 2020).

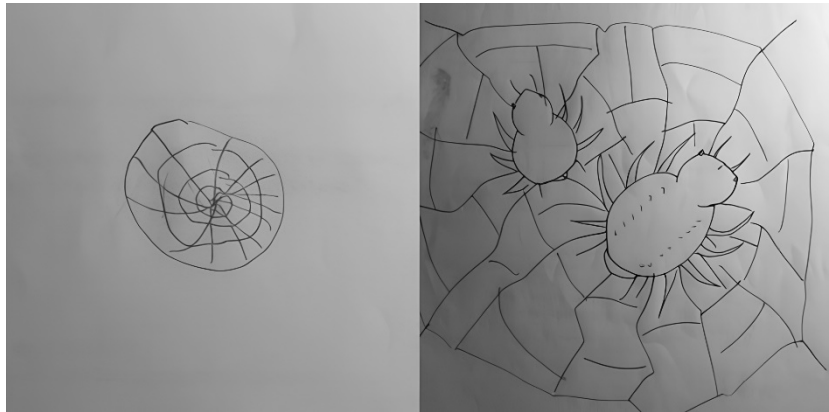


Fig. 16 Participants' drawing on Media/Appearance (-).

Fear (Fig. 17)

The percentage of individuals acknowledging arachnophobia stood at 11.3%. Some people react with sheer horror at seeing a spider but struggle to articulate their fears. Research has shown that individuals who fear spiders often experience disgust, contributing to their fear of disease or contamination (Davey et al., 1998; Davey et al., 2003). Additionally, there appears to be an inherent human tendency to dread anything that might pose a threat (Knight, 2008; Gerdes et al., 2009).

Moreover, iconic Halloween settings such as haunted houses, graveyards, dungeons, and eerie tunnels, all featuring an abundance of spiders and spider webs, can further intensify the fear experienced by arachnophobic individuals.

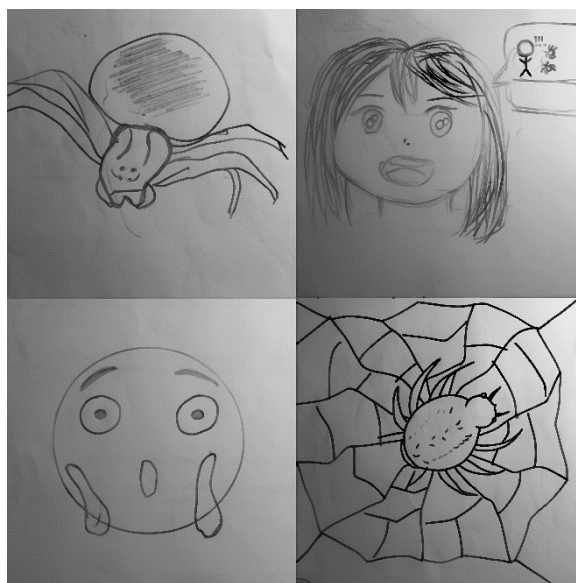


Fig. 17 Participants' drawing on Fear.

Money (Fig. 18)

Three percent of the participants regarded spiders as a potential source of income, either by scouring mountains to capture spiders for sale to spider derby enthusiasts or by participating in spider gambling activities. One participant even mentioned losing their job due to involvement in a spider derby. It is noteworthy that spiders are traded internationally for use in traditional medicine and cuisine in various countries (Ahmed et al., 2013; Ballantine, 2000).

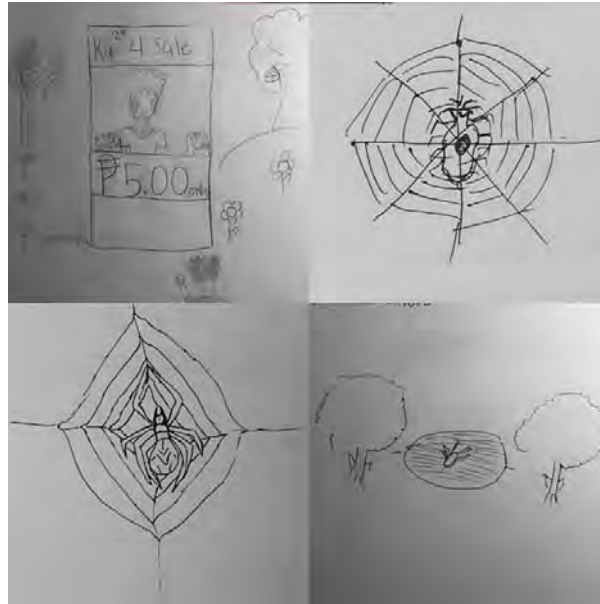


Fig. 18 Participants' drawing on Money.

Benefits (Fig. 19)

While some people find spiders frightening, 6.5% of the participants acknowledged that spiders offer numerous benefits to humans beyond pest control. For example, various aspects of spiders, including their body parts, silk, and venom, have frequently served as sources of inspiration for engineering materials, pharmaceuticals, and a wide range of other products (Hinman et al., 2000; Heim et al., 2009; Kang et al., 2014; Moore et al., 2013).

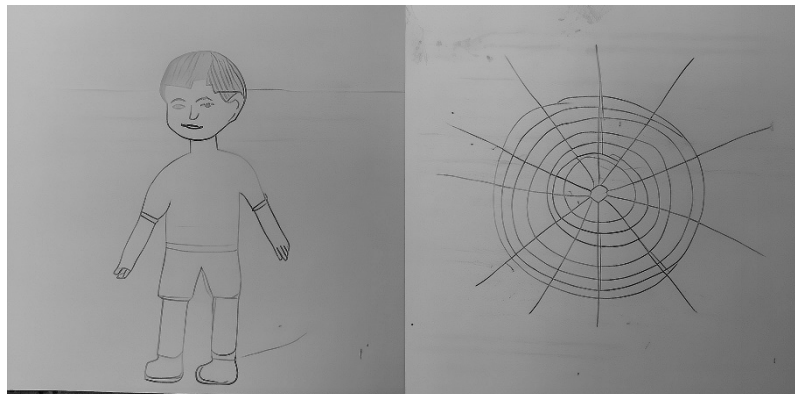


Fig. 19 Participants' drawing on benefits.

Conservation (Fig. 20)

Most participants (21.1%) agreed with the idea of protecting spiders. Ecosystems worldwide are currently grappling with the challenge of preserving spider populations, some of which face the imminent threat of extinction. Spiders play a vital role in these environments, reducing insect populations and promoting thriving habitats. Unfortunately, human-induced habitat degradation and the effects of climate change have led to a notable decline in spider populations in recent years (Ondej, 2014).

While regulations exist to safeguard endangered spider species, the conservation task can be daunting, particularly when faced with insufficient resources and efforts (Melano et al., 2021).

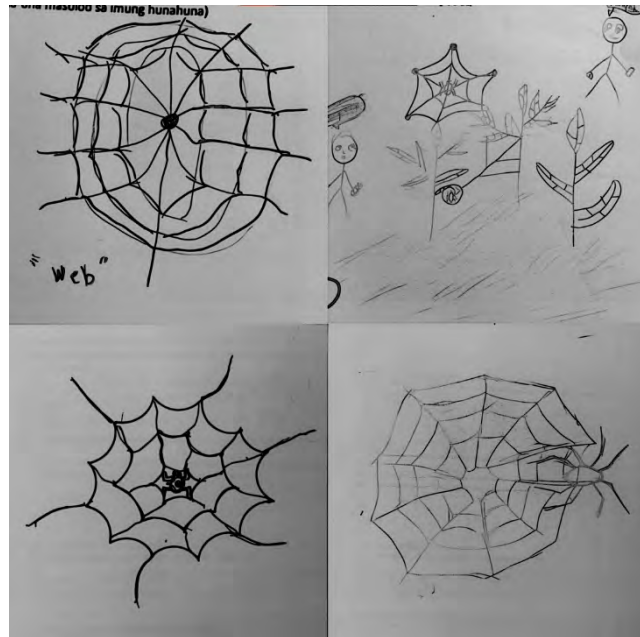


Fig. 20 Participants' drawing on Conservation.

Pet (Fig. 21)

Collecting spiders as pets in remote areas is relatively uncommon, with only 4.8% of the participants considering it a common practice. While the drawings may suggest a spider derby scenario with spiders engaged in matches, the participants clarify that the spiders are being collected for personal collection and not for commercial purposes.

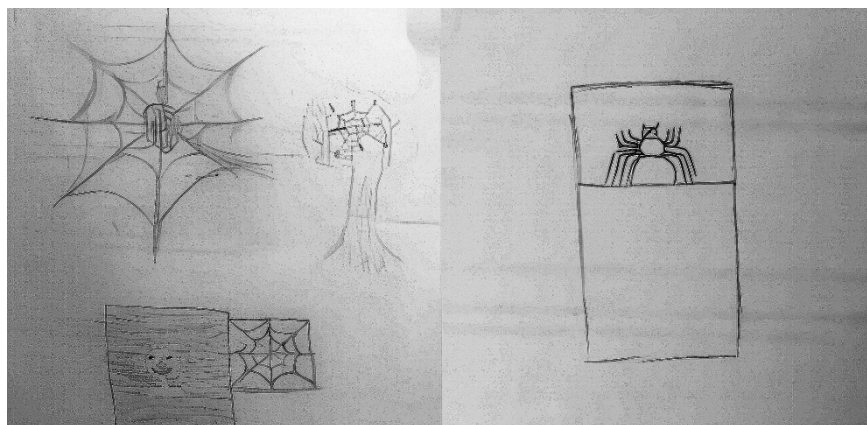


Fig. 21 Participants' drawing on Pet.

Cannot survive without web (Fig. 22)

Female spiders possess more comprehensive cylindrical silk glands, enabling them to produce more silk than their male counterparts. This characteristic allows them to construct webs for hunting. Nevertheless, it is important to note that certain spider species live in burrows and employ ambush tactics to capture their prey (Townley and Harms, 2020). Interestingly, four percent of the participants depicted a spider that relies solely on its web for survival.

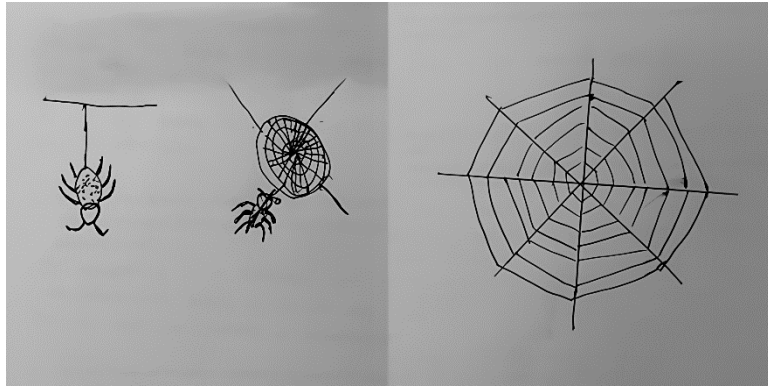


Fig. 22 Participants' drawing on Cannot survive without Web.

Defense mechanism (Fig. 23)

Spiders are generally cautious creatures, often opting to flee rather than resort to biting when encountering humans. A mere 1.6% of the participants believed that spiders only attack when they perceive a direct threat of being crushed. Participants believed that creating webs served as a protective measure for spiders, a notion that holds true for orb-weaver spiders (Blackledge and Wenzel, 2001). It's noteworthy that various spider species employ diverse survival strategies, including camouflage to evade predators and burrow-digging behavior (Théry and Casas, 2002; Théry et al., 2005; Nentwig et al., 2022). In addition, spiders typically reserve their venom as a final defense mechanism (Siemens et al., 2006; Osteen et al., 2016).

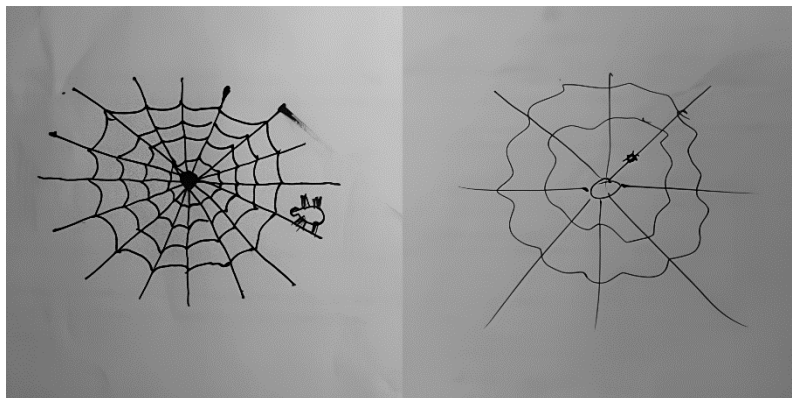


Fig. 23 Participants' drawing on the Defense mechanism.

3.2 Perceptions between sexes

The perceptions of both sexes regarding spiders are summarized in Fig. 24 below. Notably, both genders share similar views about spiders serving as effective agents for insect control. However, when it comes to entertainment, men are more inclined than women to participate in arachnid derbies. These differences in perception partially explain why males who have been bitten (+,-) tend to exhibit more positive outcomes than females.

On the other hand, women demonstrate a significant advantage over men in terms of internet-based knowledge, gossip, or general image of spiders, potentially because men often search for spiders outdoors and recognize that not all spiders reside in webs. Additionally, females tend to outperform males in their perception of spider sentience, and a study conducted by Loffler and Greitemeyer (2021) suggests that females tend to be more empathetic, which may explain their support for spider conservation efforts.

However, it is interesting to note that while most females perceive spiders as parasites that should be eliminated, this perception may be influenced by the fact that women typically handle domestic chores such as cobweb removal, especially in rural areas. Furthermore, the fear and media/appearance (-) results among females indicate a generally negative view of spiders, possibly influenced by horror films depicting spiders negatively.

In contrast, media exposure positively influences male perceptions, potentially linked to the success and idolization of Spiderman films.

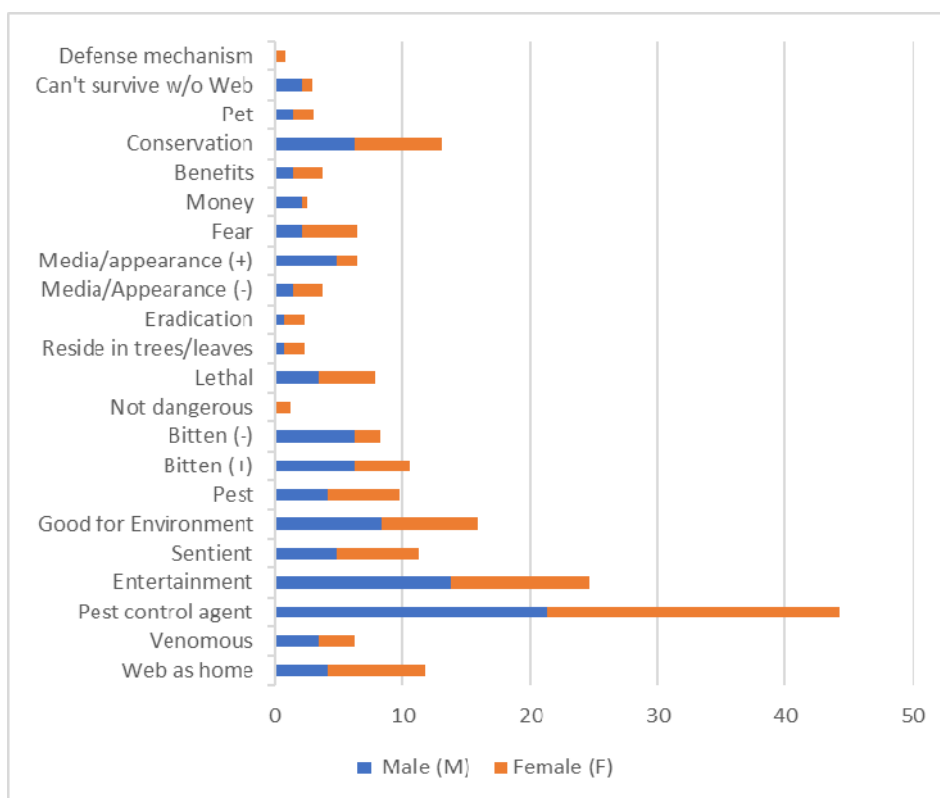


Fig. 24 Perceptions between sexes of spiders (%).

The perceptions of spiders among various religious groups are presented in Fig. 25. It is important to note that the results cannot be directly attributed to specific religious groups due to the limited number of participants from different religious backgrounds. However, the findings suggest that all other religions

prioritize pest control measures as their primary concern except for the Iglesia ni Cristo religious group.

Among Roman Catholics, the emphasis is on conservation and the overall environmental benefit, while Entertainment ranks lower in importance. On the other hand, Born Again adherents rank Lethality and media as secondary factors, which is aligned with their strong emphasis on environmental well-being. Interestingly, no members of the Born Again group indicated participation in Entertainment.

The perceptions of spiders based on educational backgrounds are detailed in Fig. 26. It is important to note that most individuals, regardless of their educational level, primarily view spiders as valuable insect control tools and, subsequently, as enjoyment sources. Pests and Fear exhibit noteworthy effects on perceptions of spiders' media representation and appearance at a fundamental level (-).

In junior high school, perceptions shift significantly towards positive aspects such as environmental preservation and the benefits spiders provide to the environment, diverging from the perceptions observed in earlier grades. This shift may indicate that students are learning about conservation awareness or the importance of small organisms at this educational stage, possibly as part of their curriculum.

Interestingly, perceptions of conservation scores in senior high school have declined slightly, but there is a marginal increase in scores related to environmental compassion.

The highest levels of concern regarding venom and the risk of being bitten by venomous spider species are observed among secondary school students. Pupils at this educational level are more likely to interact with their peers. They may tend to share exaggerated information about the dangers of spider venom, contributing to a heightened fear of spiders.

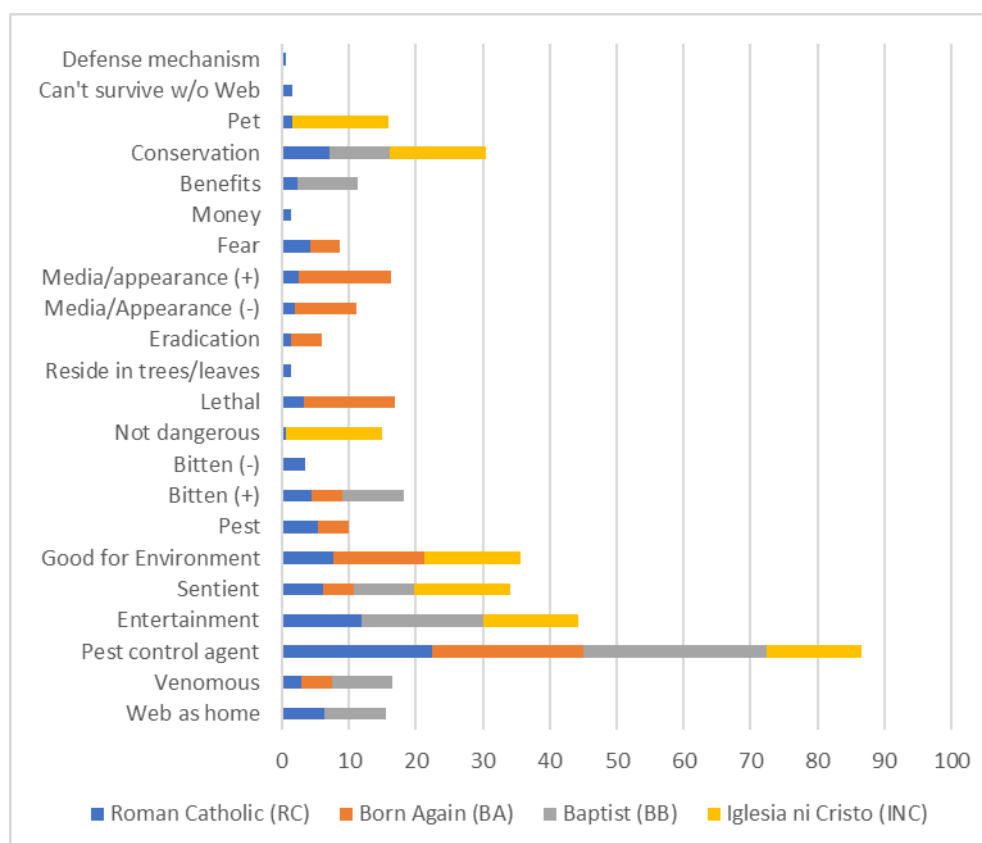


Fig. 25 Perceptions of spiders among different religious groups (%).

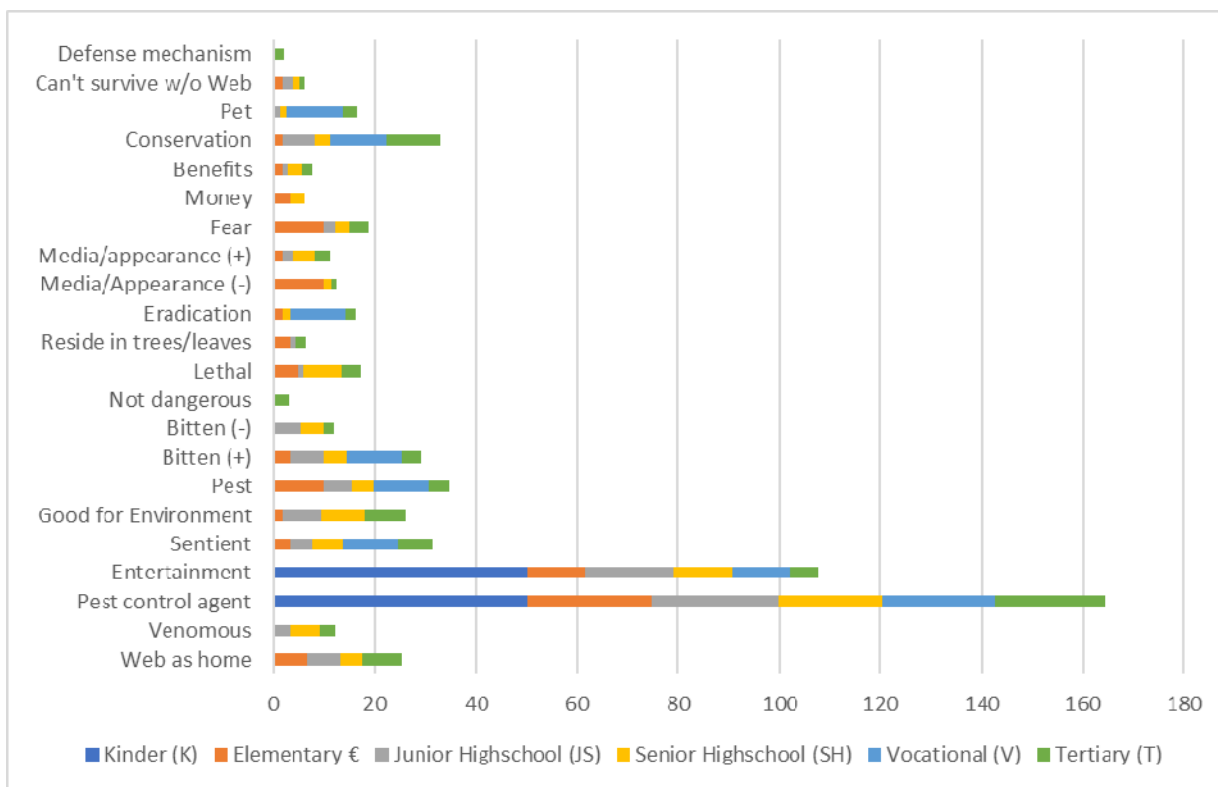


Fig. 26 Relationship between education level and dependent variables (%).

The perception of spiders based on different age groups is outlined in Fig. 27 below. It is worth noting that children aged 6 to 12 are typically actively seeking spiders outdoors, which explains why the perception of spiders living in trees or leaves is more common among this age group compared to the web as home. This observation also aligns with why children in this age range tend to earn the most money, possibly through activities related to spiders.

Furthermore, the data indicates that children aged 13 to 19 exhibit the second highest concern regarding spider lethality, corroborating the findings in the senior high school results detailed in Table 5. Between the ages of 20 and 26, there is a notable peak in conservation-related perceptions, suggesting a heightened awareness and interest in environmental preservation within this age group. For individuals between the ages of 27 and 33, sentiments of sentience and entertainment produce comparable effects. Interestingly, this group also experiences more spider bites than those who favor spiders.

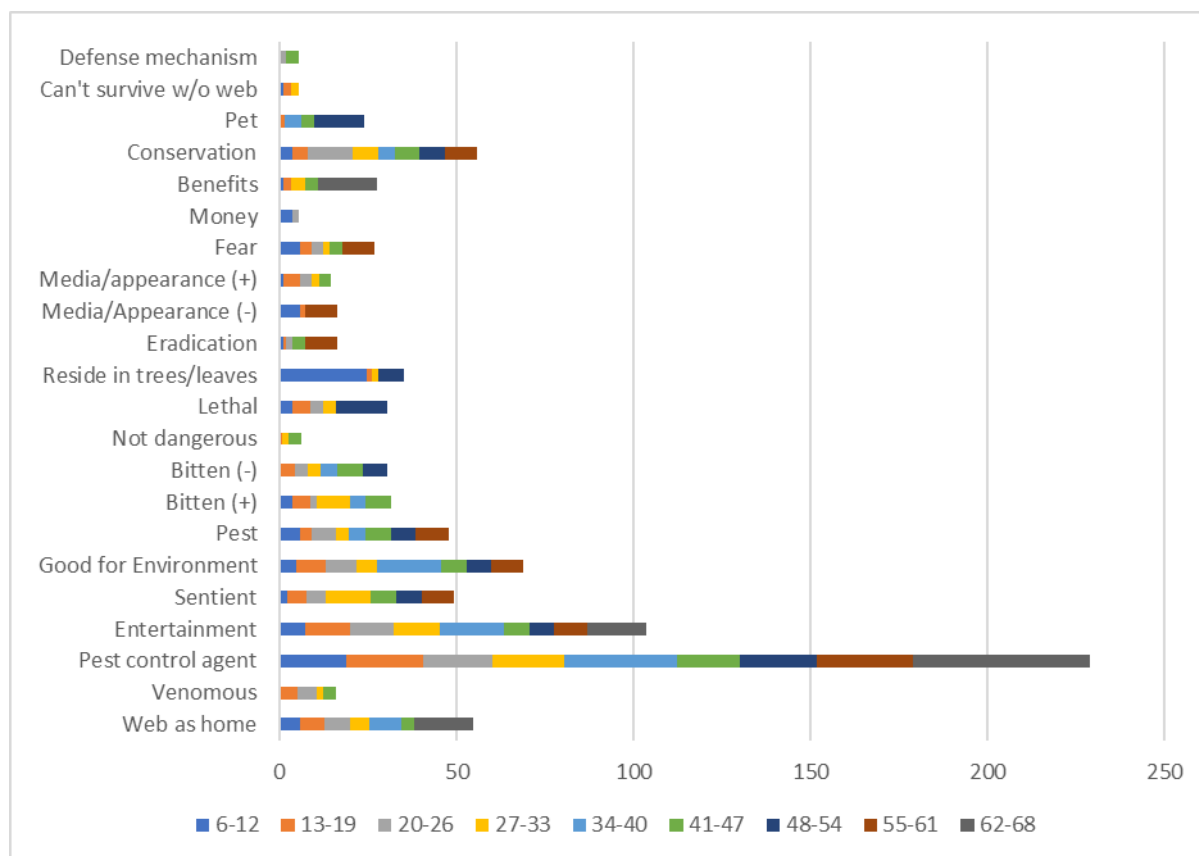


Fig. 27 Perceptions of spiders based on the age of participants (%).

3.3 Collection and identification

During the study, 13 different spider species were collected, as illustrated in Plate 1. Notably, two out of the 13 species have been identified to the genus level, and among them are two species displaying distinct variations: *Neoconarumpfi* and *Neoconapunctigera* (Thorell).



Plate 1 A-B. *Neoscona punctigera*; C. *N. vigilans* (Blackwall); D. *N. facundoi* Barrion-Dupo; E-G. *N. rumpfi* (Thorell); H. *N. Lipana* Barrion-Dupo; I. *N. nautica* (L. Koch); J. *Neoscona* sp.; K. *Gasteracanthakuhlii* C.L. Koch; L. *Araneus* sp.; M. *Poltysjuorum*; N. *P. milledgei*; O. *P. illepidus*; P. *Poltys* sp.

3.4 Validation

As part of our research, capturing spiders was essential to gain insights into how the local population perceives and feels about spiders. Among the spiders collected, four are known by widely recognized names among the respondents: *Neoscona facundoi*, affectionately called 'Numero Uno'; *Neoscona punctigera*, known as 'Tiger Tiger'; *Neoscona* sp., referred to as 'Tuklotuklo'; and *Poltys* sp., nicknamed 'Camel.' It is worth noting that the venom toxicity of these species remains unknown. However, research on congeneric spider species, such as *Neoscona arabesca* and *Araneus gemma*, has been published, suggesting that their venom may inhibit synaptic transmission at an insect's neuromuscular junction (Usherwood and Duce, 1985; Jackson et al., 1985; Usherwood, 1987). While the venom of *Araneus gemma* temporarily paralyzes locust muscles (Bateman et al., 1985), its effect diminishes over time. *Araneus ventricosus* produces similar results (Kawai et al., 1983). Importantly, these venoms are not lethal to humans or animals, as they are specifically effective on insects, and their effects typically wane over time. Despite these findings, media portrayal may have significantly influenced public perception of spiders. Research by Mammola et al. (2020a) revealed that 32% of spider-related news was exaggerated, contributing to arachnophobia in 70% of cases (Mammola et al., 2020b). It is crucial to note that the spiders collected in our study were not harmful to humans, and various studies support

the fact that documented fatalities from spider bites have been exceedingly rare in recent years (Nentwig and Kuhn-Nentwig, 2013; Nentwig et al., 2013; Stuber and Nentwig, 2016).

4 Summary and Conclusions

This study has uncovered various perceptions and emotions related to spiders based on artistic and narrative data. While some individuals fear spiders, others find them amusing and enjoyable. Some respondents expressed concerns about their potential toxicity, while others recognized their vital role in maintaining ecosystem stability. Unpleasant encounters with spiders often intensified feelings of fear and disgust towards these creatures. Interestingly, interactions with spiders, especially those involving spider bites, frequently evoked strong emotional responses. Surprisingly, some participants who had experienced spider bites expressed newfound optimism for spider conservation, which was unexpected.

However, it is important to note that individuals bitten often embellished their stories, causing anxiety among their peers. In a rumor-driven society, information about spiders can be accurate and exaggerated. Many participants openly shared their disgust, fear, and annoyance towards spiders. Some believed spider venom was the root of their fear, while others viewed spiders as dangerous creatures that should be killed on sight.

Notably, individuals of all ages and genders had previously engaged in spider derbies, often unaware that the spiders they were battling were mostly females. Young males, typically between the ages of 6 and 12, were more likely to hunt for spiders in the wild and sell them. Despite research indicating that only 0.5% of spiders pose a danger to humans, intense fear and aversion persist. If left unaddressed, these narratives and perceptions could endanger spider populations. Consequently, awareness-raising initiatives are crucial to promote a more balanced and informed understanding of these creatures.

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