# Nyctophobia: From Imagined to Realistic Fears of the Dark

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**ABSTRACT.** Fear is a quick response, which allows for a reply to an imminent threat (Coelho & Purkis, 2009). The lack of any kind of visual stimuli increases anxiety, uncertainty, and tension (Grillon, Pellowski, Merikangas, & Davis, 1997) and thus can lead to fear of the dark. It may be that the *unrealistic* fear of the dark transforms to a more realistic fear in adults. Participants in the present study included 31 male and 91 female undergraduates attending a small private university. Participants rated different fears including the fear of the dark, completed an anxiety survey modified to examine fear of the dark, and rated their comfort in regard to images taken at locations both during the day and at night. Over 50% of all participants rated the dark within their top 5 fears. Significant differences were found between all 7 pairs of day/night photos, indicating that participants were more uncomfortable with the night photos. Effect sizes ranged from 0.65 to 1.63. There were also significant sex differences for all but one of the paired photos. Effect sizes ranged from 0.42 to 0.80. Future studies could create a fear of the dark inventory to use along with images or actual nighttime walkthroughs.

Fear is a quick response, which allows for a reply to an imminent threat (Coelho & Purkis, 2009). According to Begley (2007), "the primitive nature of fear means that it can be triggered [not only by words] but by images that make a beeline for the brain's emotional regions" (p. 3). Thus, fear is a basic emotion that can be experienced in all developmental stages (Berk, 2011; Bhugra, 2006). Fears may include fears of thunder and lightning, the dark, and supernatural beings in early childhood (Berk, 2011) to fear of death in later stages of development (Florian & Mikulincer, 1997; Wink & Scott, 2005). Fears developed early in life could affect the lives of individuals as they age. There are very few studies that examine fear of the dark in adults. Thus, the current study sought to examine this type of fear in college students.

## Learning Fear

Early studies of learning fears focused on the classical conditioning model of learning (Field, 2006). One of the most famous examples is that of Little Albert. Watson and Rayner (1920) discovered that a neutral-conditioned stimulus paired with an aversive unconditioned stimulus may over time lead to a conditioned fear response with just the presentation of the conditioned stimulus. Although there have been numerous examples supporting that fear can be learned through classical conditioning, many researchers believe that this is an insufficient explanation of the development of fear (Field, 2006). There are various reasons for this belief. One is that vast quantities of individuals do not have, or cannot remember, a conditioning experience before the development of their phobia (Field, 2006). This lack of memory of a conditioning experience is common among people with phobias, which shows that the memory is not necessary for the development of the phobia (Adler & Cook-Nobles, 2011). Another reason that conditioning may not be an appropriate explanation of learning fear is that not all people who experience a trauma or unconditioned stimuli develop a phobia (Field, 2006).

A more appropriate model of learning fear may be the nonassociative perspective, which says that fears reflect a more innate response based on



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evolutionary cues (Coelho & Purkis, 2009). Fear has been essential to human and other mammalian evolution (Ohman & Mineka, 2001). What makes fears so easy for humans to learn is their preparedness to learn. Evolution requires organisms to form fears and phobias in response to stimuli that are survival relevant (Ohman & Mineka, 2001). The evolutionary dominance in the brain overpowers the brain's ability to reason because "fear tends to overrule reason" (Begley, 2007, p. 2). Because of this, it is easy to evoke reasons for fear that lie in our evolutionary past, making it easy to react to a threat that is really nonexistent (Begley, 2007). This may be why many people are afraid of the dark at one point in their lives. When this fear of the dark is strong, a specific phobia can develop.

## Nyctophobia: Fear of the Dark

A specific phobia is an extreme irrational fear of a particular identified stimulus that results in anxiety symptoms, distress, and voluntary avoidance (Flatt & King, 2010). Specific phobias are the third most common of all mental disorders; 10 to 12% of individuals will experience at least one phobia throughout their lives (Adler & Cook-Nobles, 2011). Common phobias include fear of public speaking, meeting new people, heights, specific animals, tight spaces, injections and/or blood, and certain aspects of nature (Meltzer et al., 2008; Seim & Spates, 2010). These phobic anxieties can be severe enough to lead to significant social and work-related problems (Adler & Cook-Nobles, 2011). About 8 to 10% of young people suffer from symptoms that obstruct their daily lives and school performance (Flatt & King, 2010).

Many studies have demonstrated that humans are afraid of the dark (Berk, 2011; Grillion et al., 1997; King, Muris, & Ollendick, 2005; Meltzer et al., 2008; Nasar & Jones, 1997). The lack of any kind of visual stimuli increases anxiety, uncertainty, and tension in people (Grillon et al., 1997). Children are at greater risk for this fear (Grillon et al., 1997). Fear of the dark is common in children and is considered a normal response during development (King et al., 2005; Meltzer et al., 2008). Darkness facilitates a startle response in the brain that increases anxiety (Grillon et al., 1997). The brain is wired to "flinch first and ask questions later" (Begley, 2007, p. 2). Most of the time, this fear is short-lived, but in some cases the fear can be very problematic. It can persist throughout development and strengthen in magnitude (King et al., 2005).

It is also important to examine culture in order to fully grasp how darkness can affect an individual. The impact of folk tales and stories play an important role during the development of people (Bhugra, 2006). This idea of storytelling can lead to the formation of a collective unconsciousness that can help to explain how fears can be seen all over the world (Bhugra, 2006). Studies have shown how ethnic and cultural differences have had an effect on specific fears, and not all people express fears the same way (Meltzer et al., 2008). One study found that children from the Middle East and West Indies show a much higher rate of fear of the dark than most White American children (Meltzer et al., 2008). A reason for this may be that children in cultures that do not encourage individualism may form fears easier than children in environments that are very individualistic (Meltzer et al., 2008).

## Darkness: A Realistic Fear

Children develop certain fears in response to specific points in their development due to environmental factors, which may not be rational or realistic. Older children, on the other hand, tend to have more realistic fears (Meltzer et al., 2008). In the adult population, the frequency of specific phobias is believed to be quite high (Seim & Spates, 2010). Roughly between 11 and 12% of men and women will endure some kind of phobic symptoms at some time in their lives (Seim & Spates, 2010). However, there is little evidence discussing the prevalence of specific fears in college-age individuals (Seim & Spates, 2010). Adler and Cook-Nobles (2011) found that roughly one third of college-aged individuals suffer from significant specific phobic symptoms.

Seim and Spates (2010) also found that a sample of college students had phobic symptoms of spiders (38%), public speaking (31%), snakes (22%), heights (18%), and injections (16%). It is very possible that these fears can affect the performance of students in their education and social lives (Seim & Spates, 2010). Seim and Spates (2010) found that 18.6% of their sample claimed that they had a fear that was not formally addressed in the survey, and 1.4% of them stated that they had a fear of the dark. However, the researchers did not officially examine these findings. Seim and Spates stated that "the true prevalence of these 'atypical' fears cannot be accessed via this study . . . thus, it is possible that the prevalence of some of these fears may be higher than the current figures suggest" (p. 52). It is very possible that specific phobias such as fear of the dark may be quite prevalent on college campuses,



and that students may suffer from these symptoms at high levels of severity.

It may be that the unrealistic fear of the dark that is seen in children might have transformed into a more realistic fear of the dark in adults. Adults may be afraid of the dark on the basis that it could put them at a higher risk for victimization. This fear of victimization may cause people to be less likely to participate in activities that take place in the evening when it is dark (Caiazza, 2005). The idea of what may happen at night evokes higher levels of fear in individuals (Nasar & Jones, 1997).

Roughly 40% of Americans claim that they would be afraid to walk within 1 mile of their homes at night (Berke, 1994). People believe that, even if they are afraid when no danger is present, their reactions may save them if there is ever a situation where a threat exists (Nasar & Jones, 1997). Nasar and Jones examined how aspects of concealment, hiding places, and dark spots had an effect on how people viewed fear of crime in the dark. In their study, participants included a small group of female college students who were asked to walk around a college campus while verbally recording how different aspects of the environment affected their levels of fear. The researchers found that the participants felt a decreased sense of safety when there were numerous places for other people to hide in the dark such as shrubs or parked cars. In this type of climate, an approaching stranger can produce a certain level of fear in another person. However, it is not necessary for that person to see the stranger. The knowledge that the stranger may be there is enough to induce fear (Nasar & Jones, 1997).

Women are more likely than men to see themselves as having a higher probability of being victimized (Caiazza, 2005; Fetchenhauer & Buunk, 2005). This is especially true for younger women (Jackson, 2009; Nasar & Jones, 1997). Women fear crime more though, in reality, they are less often the victims of a violent crime (Fetchenhauer & Buunk, 2005). However, sexual victimization is still reported in high levels. For example, 50% of women attending college reported some kind of sexual aggression, and 25% of that population reported an attempted or completed rape (Fisher, Cullen, & Turner, 2000; Koss, Gidycz, & Wisniewski, 1987). It is possible that, because of this, women feel that they are less able to defend themselves if they were to be attacked (Jackson, 2009). Women have also been shown to fear for others in regard to victimization (Rader & Cossman, 2011).

### Current Study

A significant amount of fear of darkness may exist in college students. This fear may be a classical fear seen in conditioned children that has not been outgrown or it could have evolved into more of a realistic fear of the dark that plays to people's fear of being victimized in the dark. For the current study we predicted that a significant fear of darkness would be found at a college campus. We also predicted that, following the information given by Nasar and Jones (1997), fear levels would be heightened when individuals were presented with scenarios where someone could be concealing themselves by using the dark. Specifically, we predicted that nighttime photos would be rated as less comfortable than daytime photos. A within subjects design was used because all participants rated both the day and nighttime photos.

## Method

### Participants

Participants consisted of 122 undergraduate students recruited from various academic departments at a small private university in the Southeast. The sample included 31 male and 91 female participants. Nine participants did not complete the fear-rating measure correctly, so their responses were excluded from analyses using that measure. The ages of students ranged from 18 to 35, with an average age of 20 ($SD$ = 2.45). Most of the sample was European American (59%), 14% were Latino/Latina, 8% were African American, 5% were Caribbean, 5% were Asian American, and 5% reported other. Additionally, 25% of the sample were seniors, 30% were juniors, 33% were sophomores, and 10% were first-year students.

Following institutional review board approval, participants were gathered via convenience sampling. Most were asked to either fill out a packet during class time or were provided web addresses to complete it online. Other participants were collected via word of mouth throughout the university campus. All participants were asked to volunteer by completing a paper survey packet or the survey online after agreeing to participate in the study. It is possible that students received extra credit in classes for participation in this study.

### Materials

Each participant received either a paper questionnaire packet or a link to an online survey. Each survey contained a written consent form, a demographics questionnaire, a phobia-rating

questionnaire (see Appendix A), the Zung Self-Rating Anxiety Scale (Zung, 1971) modified for darkness (SAS-Darkness or SAS-D), and a fear-of-the dark picture-rating scale (see Appendix B). The demographics questionnaire, the phobia-rating questionnaire, and the fear-of-the-dark picture-rating scale were created by the authors of the present study.

The phobia-rating questionnaire gives a list of 10 common phobias based on research lists used by Meltzer et al. (2008) and Seim and Spates (2010). Participants were asked to rank the phobias on a 1 (*most fearful*) to 10 (*least fearful*) scale. Participants used each and every number only once. This measure is located in Appendix A.

The SAS consists of 20 items that are scored on a 4-point scale including *some or little of the time, some of the time, good part of the time, most or all of the time* (Zung, 1971). In the present study, participants answered the 20 items in regard to their feelings about the dark. The 4-point Likert-type scale answers were kept exactly the same as the original instrument to retain the highest level of validity as possible. Scores ranged from 20 to 80 with scores over 50 suggesting the presence of a meaningful fear of the dark (Zung, 1971). Higher scores represent higher levels of anxiety. Alpha ratings for the original instrument were .80. In the current study, the measure demonstrated high reliability ($\alpha = .86$). This survey is in the public domain and is free to use for research purposes.

For the final part of this study, participants were asked to complete a fear-of-the-dark picture-rating survey. The images in this survey were created by the current authors and were taken to best resemble sample images published in Nasar and Jones's (1997) study. Similar to the campus walkthrough used in Nasar and Jones's (1997) study, the pictures in this survey used aspects of the environment such as areas of concealment as well as areas of openness to elicit participants' reactions. The survey consisted of 14 pictures: seven daytime photos and seven nighttime photos. A sample of these photos is located in Appendix B. The pictures were paired so that accurate comparisons could be made. Each photo pair was taken at the same place but at different times of the day (one during the daytime and one at nighttime). Participants were asked to rate, on a Likert-type scale, how comfortable they would feel if they were at the location in each picture. Scores ranged from 1 (*very comfortable*) to 7 (*very uncomfortable*). Participants were also asked to briefly explain why they rated each photo the way they did. This question was open-ended to facilitate any possible responses that participants had. The series of 14 photographs were shown to each participant in a random order to best eliminate any external confounds.

### Procedure

Due to the nature of the present study, participants were told that the purpose of the study was to collect data on specific fears. Participants were also told that they could quit at any time if they did not feel comfortable continuing.

At the beginning of each survey, participants read a written consent form or virtual assent form. For the paper surveys, consent forms were separated from the questionnaire packets and collected independently from the surveys to insure participants' confidentiality. For the online participants, no physical written consent was collected. Instead participants read an exact copy of the consent form that was in the written packets online and were asked to voluntarily give their assent to participate in the study. Participants answered each item in the survey to the best of their abilities and to not leave any items blank. All instructions were also available at the top of each questionnaire.

After each paper questionnaire packet was collected, participants were given a short debriefing on the study by the authors. They were told exactly what the study was about and were given the opportunity to ask any questions or express concerns. Participants who completed the study online were given the same debriefing information.

## Results

Out of the 122 participants, only 10 people rated the dark as their primary fear. However, 54% of all participants rated the dark within their top five fears. Fear of specific animals was rated first by the most participants ($n = 20$). Figure 1 shows how often each fear was given a rating as most frightful.

The SAS-D had a large range of responses from 20, which is the lowest possible score, to 65. The average score was a 34.93 ($SD = 8.76$), which indicated a low level of anxiety. However, 5% of participants scored over 50, which indicated a high level of anxiety.

In addition to examining anxiety levels, paired-samples *t* tests were also calculated to compare participants' fear of the dark within the day and nighttime photos. The purpose of this measure was to examine if participants were less comfortable with the nighttime photos. For all seven paired



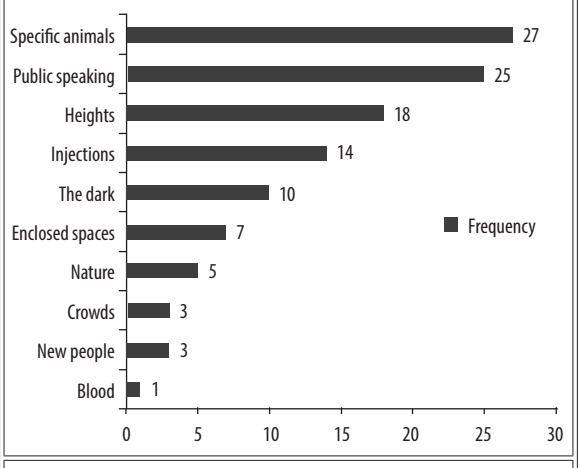
photographs, a significant difference was found. Results of these *t* tests and effect sizes are found in Table 1. Participants rated themselves more uncomfortable if they were at the nighttime locations. The photograph of the nighttime alleyway had the highest average score of all the nighttime photos ($M = 5.37$, $SD = 1.55$). This was a significant difference from the photograph of the nighttime gazebo, which had the lowest average score ($M = 2.48$, $SD = 1.47$). The nighttime walkway, field, and path had averages 4.75, 4.71 and 4.72, respectively (*SD*s were 1.68, 2.11, and 1.81, respectively). The nighttime parking lot had an average score of 4.05 ($SD = 1.76$). The nighttime street had an average score of 3.72 ($SD = 1.74$).

Independent-samples *t* tests were calculated to examine possible sex differences in ratings of the seven nighttime photographs as well as scores on the SAS-D. Results of the *t* tests and effect sizes are located in Table 2. Men scored significantly lower on all but one of the photographs (showing lower amounts of fear) and also scored lower on the SAS-D.

Pearson's correlations were calculated to examine relationships between comfort associated with each of the seven nighttime photographs and the total on the SAS-D. Correlational analyses are located in Table 3. Significant positive relationships were found between all seven photographs and the SAS-D total, indicating that the higher a participant scored on the SAS-D the more likely they were to rate a photograph as being more uncomfortable.

**FIGURE 1**

**Frequency of Fears Being Rated Number 1**




*Note.* The number of times each specific fear was given a rank of 1, being most fearful, by participants is shown.

This also means that, if a participant was to rate one photograph as being more uncomfortable, he or she was more likely to rate the other photographs as more uncomfortable. Correlations were also run using Spearman's Rho coefficient to compare the rating of participants' fear of the dark with the seven nighttime photos and the SAS-D total. Significant negative relationships were found between how participants ranked the fear of the dark and total SAS-D scores, as well as three of the seven photographs: the nighttime parking lot, pathway, and gazebo. This indicated that the closer to 1 a participant ranked fear of the dark, the more likely he or she was to score higher on the SAS-D or rate the four photographs as being more uncomfortable.

Finally, responses were recorded from the open-ended questions asked in the picture-rating survey. On all seven of the nighttime images, participants expressed some concern of being victimized. For the nighttime alleyway image, which was rated the most uncomfortable, 100% of participants who answered the open-ended question mentioned some concern about being victimized at the location or who/what might be hiding at the location. This was a big difference from the nighttime gazebo image that was rated as being the most comfortable. Less than 10% of participants who answered the open-ended question linked to this image had any concerns with victimization. The majority of answers actually dealt with being comfortable at this particular location. Although the other images varied in answers, 50% or more of the participants expressed concerns with being victimized in the dark.

## Discussion

It was expected that more individuals would rate fear of the dark higher than what was actually recorded for the present study. Although participants in general might not have ranked fear of the dark as one of their top fears or scored low on the SAS-D, their scores on the photographs told researchers that there was a level of fear present. Participants rated all seven of the nighttime photos as more fear inducing than the paired daytime photos. Because the day and nighttime photos were paired, it was possible to eliminate location as the cause of this difference. However, there were differences in photograph scores due to the location of the photograph. As stated earlier, there were big differences between the nighttime alleyway photo and the nighttime gazebo photo. The nighttime

alleyway photo had an average rating of 5.37, which put it on the uncomfortable side of the 7-point Likert-type scale. This was also the image that was given the highest rating of 7 by participants. In contrast, the nighttime gazebo image was only given an average rating of 2.48, which actually falls on the comfortable side of the 7-point Likert-type scale. It was also not uncommon to see participants give this image a rating of 1.

Further examination of what participants stated in their written responses to each photograph may help to understand such a big difference, even between the nighttime images. A very common written response, regardless of which nighttime image was viewed, was simply that the dark itself was a key factor in making the location uncomfortable. Lack of people and limited light sources were also common factors among all images.

In regard to the photograph of the nighttime alleyway, common responses that participants gave to indicate why they felt uncomfortable had a lot to do with being victimized. Responses such as the possibility of being attacked or the location being dangerous were frequent. Some even reported the fear of gang activity at the location. One participant indicated that he or she thought it might be a place for a murderer to "dump a body."

On the other hand, responses toward the nighttime gazebo image were very different. The average person felt comfortable at this location and indicated so in the written responses. Common responses indicated that the location was well lit, beautiful, romantic, and peaceful. This shows some indication that, though the dark has an effect on how frightened people feel in a certain location, their level of fear has a lot to do with the location itself.

It is also imperative to consider the significant participant sex differences found between the nighttime images. Women reported feeling less comfortable than men with all of the nighttime photos except the gazebo. The participant sex differences could be related to the possible victimization that can occur at night or in certain locations. For example, Turchick, Probst, Irvin, Chau, and Gidycz (2010) reported that cases of female victimization were more likely to involve scenarios that took place in an outdoor environment. Future research on fear of the dark in adults should assess victimization as a cause of fear perhaps through the use of interviews or open-ended questions.

There were a few limitations regarding measurement and generalizability in the current study. First, although directions were read to individuals

**TABLE 1**

**Results of Dependent *t* Test Examining Differences Between Daytime and Nighttime Photographs**

| | *M* | Difference in *M* | *SD* | *df* | *t* | *p* | *Cohen's d* |
|---|---|---|---|---|---|---|---|
| Daytime alleyway | 3.83 | -1.54 | 1.33 | 121 | -12.79 | .000 | 1.16 |
| Nighttime alleyway | 5.37 | | | | | | |
| Daytime walkway | 1.70 | -3.05 | 2.46 | 121 | -13.71 | .000 | 0.74 |
| Nighttime walkway | 4.75 | | | | | | |
| Daytime field | 1.98 | -2.73 | 2.27 | 121 | -13.32 | .000 | 1.20 |
| Nighttime field | 4.71 | | | | | | |
| Daytime parking lot | 1.70 | -2.34 | 1.78 | 121 | -14.54 | .000 | 0.65 |
| Nighttime parking lot | 4.05 | | | | | | |
| Daytime path | 2.36 | -2.36 | 1.85 | 121 | -14.06 | .000 | 1.63 |
| Nighttime path | 4.72 | | | | | | |
| Daytime gazebo | 1.43 | -1.04 | 1.63 | 121 | -7.13 | .000 | 0.64 |
| Nighttime gazebo | 2.48 | | | | | | |
| Daytime street | 1.68 | -2.04 | 1.72 | 121 | -13.16 | .000 | 1.19 |
| Nighttime street | 3.72 | | | | | | |

*Note.* Day and nighttime photographs are compared. Statistics and significance values for paired-samples *t* tests are given.

**TABLE 2**

**Gender Differences in Ratings of Daytime and Nighttime Photographs**

| | Men | | Women | | | | |
|---|---|---|---|---|---|---|---|
| Measure | *M* | *SD* | *M* | *SD* | *t*(120) | *p* | *Cohen's d* |
| Nighttime alley | 4.61 | 1.82 | 5.63 | 1.37 | -3.26 | .001* | .60 |
| Nighttime walkway | 3.81 | 1.70 | 5.08 | 1.56 | -3.83 | .000* | .70 |
| Nighttime field | 3.97 | 2.26 | 4.97 | 2.01 | -2.31 | .022* | .42 |
| Nighttime parking Lot | 2.94 | 1.77 | 4.43 | 1.59 | -4.38 | .000* | .80 |
| Nighttime Path | 3.68 | 1.90 | 5.08 | 1.63 | -3.94 | .000* | .72 |
| Nighttime gazebo | 2.13 | 1.31 | 2.59 | 1.51 | -1.52 | .130 | .28 |
| Nighttime street | 2.87 | 1.63 | 4.01 | 1.68 | -3.28 | .001* | .60 |
| SAS Total | 31.16 | 7.66 | 36.23 | 8.78 | -2.86 | .005* | .52 |

*Note.* Nighttime photographs and SAS totals are compared between men and women. Statistics and significance values are given.
*$t$ test is significant at $p < .05$.

(in cases of paper surveys) and printed on every survey (paper and online), nine participants did not fill out the fear-rating questionnaire correctly, and their results could not be used in the analyses that included this measure. It might also be that this lack of following directions led to very low scores on the SAS-D. If a participant did not follow the directions and used the priming information to answer the questions relating to their feelings about the dark, participants might have just been scoring their levels of general anxiety. For this reason, we do not suggest utilization of this instrument as a research tool for examining specific fear. An actual fear of the dark inventory should be developed and used in future studies in this area. Future studies may also want to look at what results could be found if an actual day and nighttime walkthrough was conducted that closely resembled the study by Nasar and Jones (1997).

It is important to note that convenience sampling was used for the present study, so the generalizability of the findings is limited. The study findings may be generalizable to a college sample, but future research should include a community sample to increase the generalizability. It also came to our attention that location might have been another limitation. Although no image was taken on the university campus, some participants local to the area knew where the images were taken and seemed to be more comfortable with the location. It may be advantageous to use images from locations away from the university campus to eliminate any familiarity with them.

In conclusion, fear of the dark in adults is an important topic that deserves further examination. Unfortunately, much of the previous research has focused on children, and there are limited research studies and measurement options for examining fear of the dark in adulthood. This may be an interesting avenue of research to delve into because not only could it bring a light to a group of people who are not being helped with their specific phobia, but it could also lead to new ideas of how to plan and develop populated environments. If this fear of the dark in an adult population really is dependent on aspects of concealment and victimization while in the dark, researchers may be able to come up with new ideas of how to eliminate such fears by eliminating the very elements of which individuals are afraid. If this fear can become more understood, it may be possible to eliminate adults' monsters that may be hiding in the dark.

**TABLE 3**

**Correlations for Fear of Darkness Ranking, Nighttime Photos, and Darkness Anxiety Scores**

| | 1 Fear of Dark Ranking | 2 Alley | 3 Walkway | 4 Field | 5 Parking lot | 6 Pathway | 7 Gazebo | 8 Street | 9 Darkness Anxiety |
|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | -.092 | -.184 | -.134 | -.211* | -.300** | -.281** | -.091 | -.262** |
| 2 | | --- | .604*** | .548*** | .514*** | .476*** | .320*** | .474*** | .304** |
| 3 | | | --- | .421*** | .524*** | .633*** | .294** | .542*** | .358*** |
| 4 | | | | --- | .337*** | .423*** | .387*** | .237** | .227* |
| 5 | | | | | --- | .429*** | .297** | .473*** | .262** |
| 6 | | | | | | --- | .318** | .460*** | .465*** |
| 7 | | | | | | | --- | .473*** | .249** |
| 8 | | | | | | | | --- | .193* |
| 9 | | | | | | | | | --- |

*Note. r* and significance values are given. The seven photos listed are the nighttime images.
Row 1 (Fear of Dark Ranking) was correlated using Spearman's Rho to account for Ranked data; Rows 2–9 used Pearson's *r*. *Correlation is significant at $p < .05$ (2-tailed). **Correlation is significant at $p < .01$ (2-tailed). ***Correlation is significant at $p < .000$ (2-tailed).

## References


Adler, J. M., & Cook-Nobles, R. (2011). The successful treatment of specific phobia in a college counseling center. *Journal of College Student Psychotherapy, 25*, 56–66. doi:10.1080/87568225.2011.532669

Begley, S. (2007, December). The roots of fear: The evolutionary primacy of the brain's fear circuitry makes it more powerful than reasoning circuits. *Newsweek*. Retrieved from http://www.newsweek.com/roots-fear-94379

Berk, L. E. (2011). *Exploring lifespan development* (2nd ed.). Boston, MA: Allyn & Bacon.

Berke, R. L. (1994, January 23). Crime is becoming nation's top fear. *The New York Times*. Retrieved from http://www.nytimes.com/1994/01/23/us/crime-is-becoming-nation-s-top-fear.html

Bhugra, D. (2006, November) Book Review [Review of the book *Outfoxing fear: Folktales from around the world*, by K. Ragan]. *International Review of Psychiatry, 18,* 315. doi:10.1080/09540260600725541

Caiazza, A. (2005). Don't bowl at night: Gender, safety, and civic participation. *Signs: Journal of Women in Culture and Society, 30*, 1607–1631. doi:10.1086/382632

Coelho, C. M., & Purkis, H. (2009). The origins of specific phobias: Influential theories and current perspectives. *Review of General Psychology, 13*, 335–348. doi:10.1037/a0017759

Fetchenhauer, D., & Buunk, B. P. (2005). How to explain gender differences in fear of crime: Towards an evolutionary approach. *Sexualities, Evolution and Gender, 7*, 95–113. doi:10.1080/10720207170500111044

Field, A. P. (2006). Is conditioning a useful framework for understanding the development and treatment of phobias? *Clinical Psychology Review, 26*, 857–875. doi:10.1016/j.cpr.2005.05.010

Fisher, B. S., Cullen, F. T., & Turner, M. G. (2000, December). *The sexual victimization of college women*. Washington, DC: National Institute of Justice and Bureau of Justice Statistics, U.S. Department of Justice. Retrieved from https://www.ncjrs.gov/pdffiles1/nij/182369.pdf

Flatt, N., & King, N. (2010). Brief psycho-social interventions in the treatment of specific childhood phobias: A controlled trial and a 1-year follow up. *Behavior Change, 27*, 130–153. doi:10.1375/bech.27.3.130

Florian, V., & Mikulincer, M. (1997). Fear of personal death in adulthood: The impact of early and recent losses. *Death Studies, 21*, 1–24. doi:10.1080/074811897202119

Grillon, C., Pellowski, M., Merikangas, K. R., & Davis, M. (1997). Darkness facilitates the acoustic startle reflex in humans. *Society of Biological Psychiatry, 42*, 453–460. doi:10.1016/S0006-3223(96)00466-0

Jackson, J. (2009). A psychological perspective on vulnerability in the fear of crime. *Psychology, Crime and Law. 15*, 365–390. doi:10.1080/10683160802275797

King, N. J., Muris, P., & Ollendick, T. H. (2005). Childhood fears and phobias: Assessment and treatment. *Child and Adolescent Mental Health, 10*, 50–56. doi:10.1111/j.1475-3588.2005.00118.x

Koss, M. P., Gidycz, C. A., & Wisniewski, N. (1987). The scope of rape: Incidence and prevalence of sexual aggression and victimization in a national sample of higher education students. *Journal of Consulting and Clinical Psychology, 55*, 162–170. doi:0022-00fiX/87/$00.75

Meltzer, H., Vostanis, P., Dogra, N., Doos, L., Ford, T., & Goodman, R. (2008). Children's specific fears. *Child: Care, Health, and Development, 35*, 781–789. doi:10.1111/j.1365-2214.2008.00908.x

Nasar, J., & Jones, K. M. (1997). Landscapes of fear and stress. *Environment and Behavior, 29*, 291–323. doi:10.1177/001391659702900301

Ohman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review, 108*, 483–522. doi:10.1037/0033-295X.108.3.483

Rader, N. E., & Cossman, J. S. (2011). Gender differences in U.S. college students' fear for others. *Sex Roles, 64*, 568–581. doi:10.1007/s11199-011-9940-5

Seim, R. W., & Spates, R. (2010). The prevalence and comorbidity of specific phobias in college students and their interest in receiving treatment. *Journal of College Student Psychotherapy, 24*, 49–58. doi:10.1080/87568220903400302

Turchick, J. A., Probst, D. R., Irvin, C. R. Chau, M., & Gidycz, C. A. (2010). Prediction of sexual assault experiences in college women based on rape scripts: A prospective analysis. *Psychology of Violence, 1*, 76–83. doi:10.1037/2152-0828.1.S.76

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*, 1–14. doi:10.1037/0003-066X.55.3.313

Wink, P., & Scott, J. (2005). Does religiousness buffer against fear of death and dying in late adulthood? Findings from a longitudinal study. *The Journals of Gerontology, 60*, 207–214. doi:10.1093/geronb/60.4.P207

Zung, W. K. (1971). A rating instrument for anxiety disorders. *Psychosomatics: Journal of Consultation and Liaison Psychiatry, 12*, 371–379.

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## APPENDIX A

### List of Fears and Phobias

Below is a list of 10 common fears and phobias. Rank them from 1 to 10, with 1 being the most frightful to you and 10 being the least. Please use each and every number (1–10) only once. Do not leave any fears out. If you are not afraid of any item on the list, please rank them in the order that you think you would be most fearful.

_____ Public Speaking

_____ Specific Animals (spiders, snakes, insects, etc.)

_____ Heights

_____ The Dark

_____ Tight Enclosed Spaces

_____ Injections

_____ Blood

_____ Crowds of People

_____ Meeting New People

_____ Certain Aspects of Nature (storms, thunder, water, etc.)

## APPENDIX B

### Fear of the Dark Rating Scale

**DIRECTIONS**: Below is a series of 14 photographs. After looking at each photograph, please answer each question pertaining to any picture. Each picture will have two questions linked to it. The first question associated with each picture asks to rate how comfortable or uncomfortable you would be if you were at the location in the image. Scores will be rated from 1 (*the most comfortable*) to 7 (*the most uncomfortable*) with 4 being neither comfortable nor uncomfortable. The second questions associated with each picture asks you to briefly explain what about being in the place the picture was taken made you rate it the way you did. **Please do not leave any items blank. All your responses are anonymous and will be kept strictly confidential.**

**Day and Nighttime Alleyway**

**Question 1**
How comfortable or uncomfortable would you be if you were at this location?

Comfortable 1 2 3 4 5 6 7 Uncomfortable

**Question 2**
Please explain briefly as to what about the image makes you either comfortable or uncomfortable.

**Day and Nighttime Gazebo**

**Question 1**
How comfortable or uncomfortable would you be if you were at this location?

Comfortable 1 2 3 4 5 6 7 Uncomfortable

**Question 2**
Please explain briefly as to what about the image makes you either comfortable or uncomfortable.

 