A Study of Personal Space Between Strangers in Public Spaces

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Abstract

The distance between individuals in public queues was studied. The observed people were purchasing products in Vancouver, Richmond, and the Sunshine Coast of British Columbia. Discreet photos were taken of queues and the distances between individuals were measured. The goal was to see what factors might mediate personal space, such as: location, speed of the queue, number of people in the queue, demographics, and the reason for being in the queue. Average personal space radius was 2 feet (60.96cm). People tended to particularly avoid being close to obvious couples/duos of people who were talking loudly. Faster queues had bigger spaces between people and slower queues had smaller spaces. Vancouver and Richmond had smaller distances between people than on the Sunshine Coast.

Background

Personal space is defined as the preferred distance from other people. Personal space is also referred to as "proxemics", a term coined by Edward T. Hallin in 1963. It is a subcategory of non-verbal communication. He proposed four stages of personal space based on "sensory shifts": Intimate (18 inches or less), Personal (1.5 to 4 feet), Social (4 to 12 feet), Public (12 feet or more). When individuals maintain an appropriate amount of personal space, they are more at ease when engaging in conversation, socializing, or standing in proximity to one another. One's personal space typically begins to develop around the ages of three to four and solidifies into a more permanent construct between the ages of ten and nineteen (Hayduk, 1983). Personal space standards differ from one individual to another and when in specific settings. Individuals generally maintain a smaller "personal bubble" with family members, loved ones, or friends. An additional factor in the perception of personal space is culture, which is, to some extent, connected to familial influences. For instance, in France it is considered common courtesy when greeting someone - typically someone you are already acquainted with - by exchanging a kiss on each cheek. In Oman, men greet each other by pressing their noses together. However in many cultures people often don't get close - for example, in Japan. They bow for greetings and other communication, as a simple bow requires zero physical contact and can be performed at any distance.

Another way that personal space can be more peripheral for an individual is the environment or a specific situation. In a crowded mall or public transportation, for example, In an individual may be more tolerant with others invading their personal space due to shared context and the understanding personal space must be limited. Individuals may strongly desire their personal space due to factors such as introversion, sensory sensitivity, cultural norms, past trauma, social anxiety, the need for focus, or health concerns, all of which can increase discomfort for close proximity to strangers. Furthermore, disease outbreaks or epidemics that pose the risk of transmitting harmful diseases or contagions can prompt people in public settings to maintain greater personal space.

The need for personal space is inherently linked to safety concerns; for instance, many people might be understandably disturbed if they are sitting in an empty bus and an unknown person enters and sits uncomfortably close. In this situation one would presumptively move or get off the bus altogether as such close proximity could provoke feelings of alarm or discomfort, highlighting the instinctive need for personal space. Standards for personal space can differ sharply due to different factors. In the present study, I would like to observe the limits and similarities of personal space in public settings and with different people.

In my study, I aim to find out if location, situation, age or gender influence how close people will stand in a queue in public spaces. I will gather my data from different areas of the Sunshine Coast, Vancouver, and Richmond to see if geographical location is a factor. I will keep track of what stores/buildings/public spaces I am in and observe the queue-ups to see if the type of queue (the cause for them being in public, e.g., at the grocery store, clothing center, etc) is of any significance. Moreover, I will also record if age or gender is a notable leading factor; for instance, I will observe if people are more likely to share a personal bubble with someone of their own gender and age. I am also looking for the average distance between people, or the average "personal space" radius. Additionally, I will be looking to see if the length of the queue will influence if people are more likely to *willingly* get closer to strangers. Also, I will be looking for any other noticeable or possible factors while I am gathering this data. For example, do people prioritize their need for personal space over the tendency to avoid confrontation? While I conduct my survey and record all relevant information so my study can be as meticulous as possible.

Review of Literature

Welsch, Castell, and Hecht (2019) wanted to determine what was the most comfortable amount of personal space from another person. They studied this by having 24 participants examine their discomfort at 15 varying distances, from 40 cm to 250 cm. The participants were told to maintain eye contact with a confederate while having a social interaction. Distances were marked with tape on the ground, but not labeled. Two confederates, both young females – one 165 cm tall and the other 167 cm tall – alternated turns, both dressed in blue jeans and white T-shirts. After each interaction, participants were asked to rate their discomfort on a scale ranging from -100 (too close) to +100 (too far). In Block 1, participants were instructed to move to designated distances with the confederate remaining stationary. In Block 2, Participants remained stationary and the confederate moved to designated distances. Participants were blindfolded during positioning; after positioning participants removed blindfold and rated their discomfort. Next participants were told to move toward the confederate until they felt most comfortable. After compiling their data they found that an intrusion of 15 cm or more beyond a comfort point led to immediate discomfort. Conversely movement away from the participant leads to immediate, but less intense, rise in discomfort. The researchers noted that the participants were most comfortable 80 cm to 100 cm apart. Additionally, for every centimeter of intrusion, discomfort rose an average of 1.36 points, while for every centimeter of distance created, discomfort rose by 0.46 points.

Diage (1989) conducted a metaanalysis of sex differences as it relates to personal space. She noted that most research done since the 1960s about sex differences showed that males in particular preferred more personal space from others. In contrast, many studies reported that females prefer the same amount of space as males do, while some studies showed that females prefer more personal space then did males. In the majority of these studies factors like age, culture, and appearance were recorded but did not contribute to much variance in the data. The metaanalysis was conducted to resolve these inconsistencies, and to become more consistent this analysis covers a total of 111 effect sizes derived from primary studies. These studies were carefully selected for their relevance to this metaanalysis. Most studies seem to be either inconclusive, significantly leaning towards an inequality in personal space preferences between genders, or the sex effect may be due towards other factors. After assessing studies that met qualifications for this analysis, the author concluded that the sex difference in personal space was very small, and in the male direction. Hayduk (1983) suggested another explanation for the sex effect on personal space. He suggested that it's not necessarily biological sex but how we perceive the other individual's gender, the complex physical and psychological characteristics the individual possesses. Bem (1974) proposed four gender roles – feminine, masculine, androgynous, and unidentified. Results of studies of personal space invasion with college students further supports this (Lombardo, 1986). The author observed that for males, face-to-face interactions increase discomfort, possibly as it seems more confrontational. For females, discomfort rises with side-by-side interactions, as they are viewed at an attempt at intimacy. Lombardo (1986) pursued the idea of gender and sex as independent variables. Results indicated that males and females with masculine characteristics had high discomfort at face-to-face

interactions, and females and males with female characteristics followed the female trend of discomfort. This shows that perceived gender is a more prominent factor over biological sex.

Sommer (1959) wanted to observe the way people who were *already interacting* were arranged. The author's hope was to learn if their difficulties in communicating related to the way they arranged themselves. Their first study was conducted in a staff dining hall in a mental hospital. The hall measured 36 by 68 feet and contained thirteen tables (36 by 72 inches), each table was two 36 by 36-inch tables surrounded by eight chairs (three chairs on each side and two at each of the heads of the table). All staff obtained their plate of food at the front of the cafeteria then sat wherever they chose. This was purely observational and had no specific hypothesis formulated. There were two observers, who would sit in different spots every meal. Once the observers agreed they had a full view of another table they would wait two minutes, then record the interactions for the next five seconds. If no interaction occurred they would move on to another table later. Both observers recorded independently, so there were two records made from each meal, and the observations were done over a two month period. In total there were 50 observations made from each observer. Both sets of observations were compared and proved to be accurate and consistent. Out of the 67 correctly averaged observations between the two observers only 18 were individuals interacting with a chair dividing them (distant chairs). Out of the 49 interactions with *neighboring chairs*. Three types of seating arrangements were recorded when there were two individuals having an interaction; face-to-face (chairs across from each other), side-by-side (chair placed directly next to each other), and corner-to-corner (chairs that are adjacent to each other). For these three possible chair pairings each had a chance expectancy; 13.9 face-to-face, 18.5 side-by-side, and 18.5 corner-to-corner. Then the numbers of pairings of people were recorded; 5 face-to-face, 16 side-by-side, and 30 corner-to-corner.

Some commonplaces emerge from reviewing the above studies which, it should be noted, do not frame sex and gender in the same way that more recent studies typically do. People tend to find discomfort with people being too close, and surprisingly people find discomfort interacting with an individual who is "too far" away. The corpus of literature surrounding sex differences related to personal space is inconclusive, and the present study aims to add to what is known about the topic.

Methods

I visited multiple locations in Sechelt, Gibsons, Richmond, and Vancouver–all in and around the Lower Mainland of BC. My goal was to quantify personal space between people in specific situations, particularly queue ups. I recorded location, time of day, speed of the queue, demographics, and how many people were in the queue and how many groups were in the queue. I discreetly took photos of the subjects of the queues and I took the photos home and analyzed the distances. I measured the distances between everyone by measuring the length of one tile and using it to estimate the distances in the photograph. The queue has to have a bare minimum of three to be recorded.

I was looking for:

-location

-date/time

-length of queue (number of people)

-average distance between people

-relative speed

-Demographics

DATA

Location	Date/Tim	Length of	Average	Relative speed	Demographics
	е	queue	distance		
Toys R us	12:34PM	5 people	1.1 feet/	2-5 minute speed	Parents, sometimes with a
(Richmond)	12/7/24		33.52cm	(medium speed)	child (Buying toys).
SHOGUN	2:08PM	4 people	1.4 feet/	4-6 minute stand	Adults, roughly the same age
(Richmond)	12/7/24	(1 duo)	42.67cm	(slow speed)	group (ordering food).
Grill King	2:11PM	10 people	3 feet/	4-6 minute stand	Adults, same age group
(Richmond)	12/7/24		91.44cm	(slow speed)	(ordering food).
T&T -kitchen	2:18PM	7 people	1.6 feet/	1-3 minute speed	Adults, same age group
(Richmond)	12/7/24	(2 duos)	48.76cm	(medium speed)	(ordering food).
Lotto	11:07AM	4 people	2.7 feet/	5-6 minute stand	Adults, roughly same age
(Vancouver)	12/21/24	(1 duo)	82.29cm	(slow speed)	group (buying lottery tickets)
Bath &	11:16AM	4 people	2.6 feet/	ten-thirty second	Varying ages (buying
bodyworks	12/21/24		79.24cm	stand	products)
(Vancouver)				(fastest speed)	
U grill	11:58AM	10 people	0.11 feet/	5-7 minute stand	Pairs of adults, same age

(Vancouver)	12/21/24	(3 duos)	3.35cm	(slowest speed)	group (self serve food)
Makers	3:16PM	6 people	1.4 feet/	5+ minute	Adults and juveniles (entering
(Vancouver)	12/21/24	(1 duo)	42.67cm	stand/wait	the store)
				(slowest speed)	
Starbucks	1:05PM	5 people	1.11 feet/	3-5 minute stand	Adults (ordering food)
(Gibsons)	12/24/24	(1 duo)	33.83cm	(slow speed)	
London Drugs	4:10PM	6 people	1.11 feet/	3-5 minute speed	Varying ages (buying
(Gibsons)	12/26/24	(1 duo)	33.83cm	(slow speed)	products)
Claytons	3:30PM	4 people	5.4 feet/	5-6 minute speed	Adults (buying groceries)
(Sechelt)	12/27/24	(1 duo)	164.59cm	(slow speed)	























Discussion

From the data table the reader can see that the average distance between people throughout the 11 queues was roughly 2.0 feet (60.96cm). The majority of queues that were recorded had 4-6 people, and most queues were queues to purchase food products. The queues recorded mostly consisted of adults, roughly 20-40 age grouping. Something I was curious about going into this study was whether people with similar age groups would stand closer, but from my observations age did not affect the spacing distribution of the queues (although you cannot tell from the photos), regardless of age I noticed people would space themselves apart evenly distributed. I also noticed that people near the front of the queue tend to stand closer compared to the last person in the queue. I suspect this is because people near the front have been waiting longer and are impatient and want to finish what they are doing faster.

Observing the queues (in person) I noticed people would stand slightly farther away from an obvious duo/couple of people than if it was a single individual, especially if the duo was conversing frequently. I suspect this is because conversations are seen as more private and personal activity, and getting close feels like you are intruding or eavesdropping. Possibly you do not wish for the others to think you are purposefully eavesdropping. Or perhaps people do not wish to hear the conversation as it's loud or uncomfortable.

The speed of the queue may affect the average distance between people; my hypothesis was that a faster queue would be more spaced out then a slower queue as it gives less time for the queue to build up. The slowest speed queues had an average distance of 0.7 feet (21.33cm), slow speed queues had an average of 2.4 feet (73.15cm), medium speed queues had an average of 1.3 feet (39.62cm), and fastest speed had an average distance of 2.6 feet (79.24cm). This data queues up with my hypothesis. The queues I observed in Richmond had roughly an average distance of

1.7 feet (51.81cm), the queues in Vancouver had a distance of 1.7 feet (51.81cm), the queues on the Sunshine Coast had an average distance of 2.5 feet (76.2cm). Richmond and Vancouver both had shorter distances between people compared to the Sunshine Coast queues, which had almost double the distance. I suspect that the cause of this is because Richmond and Vancouver are both big shopping centres in a densely populated area, while Sunshine Coast is a small town cut off from the mainland.

I would have liked to observe more locations in the Sunshine Coast but since it's far less populated it was hard to find queues that met the requirements, and there were a lot of queues that could not be recorded since the queue had tall partitions. Also if there was a better way to record the queues that wasn't discreetly taking photos, security cameras could have been more ideal to be more withdrawn. Moreover, measuring the distances was mainly done by rough estimates based on tile lengths so they may not be entirely accurate. People in the queue may have moved after the photo was taken and stayed there longer so the measurements have some leeway.

Recommendations I have for a potential reenactment of this study would be to watch the queue build from nothing to see if more people joining the queue slowly over time would affect the distribution. Moreover to go more in depth the researcher could take photos every 10 seconds or every minute to get a more accurate distribution number. It would be interesting to see what an experimental psychology study would do to see what factors can change personal space boundaries, perhaps putting up signs or queues on the floor to try to instruct people where to stand to see if people will follow instructions or ignore them in favour of personal space. Possibly seeing if physical appearance will cause people to keep a farther distance.

Conclusion

I found that the average distance people keep from others is 2.00 feet (60.96cm). People tend to stay farther away from a duo/couple who were talking loudly or frequently. People typically space themselves (roughly) evenly distributed through the queue, yet near the front of the queue people tend to stand slightly closer to the person in front of them. The number of people in the queue did not affect spacing, yet faster queues had bigger spaces between people and slow queues had people closer together. Places with bigger populations had less space between people.

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