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The Impact of Digital Communication Devices on Face-to-Face Interactions in Public Spaces: The Case Study of Coffeehouses in Cairo, Egypt

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Abstract

In public spaces, social interactions turned from physical interactions into virtual interaction (Oldenburg, 1999). Physical interaction, face-to-face interaction, weakens when people start to use Digital Communication Devices (DCD) in the physical space (Drago, 2015). The aim of the proposed study is to review the impact of DCD usage on social interactions in public spaces in Egypt, and how does time spent on DCD affect face-to-face interaction. A quantitative study will be applied to Coffeehouses in Cairo as places for leisure. Data will be collected through observations, interviews, and questionnaires to explore how time spent in physical spaces with the integration of virtual space; how DCD changes the interaction between people and how people experience the physical space. Each coffeehouse listed in the study was observed for twelve hours, a total of thirty-six hours. Eighteen interviews were conducted and surveys were collected from sixty patrons to reveal patron's attitudes toward the physical and social aspects of the coffeehouse as well as their feelings regarding the community in which they live.

Keywords: Digital Communication Devices; Face-To-Face Interactions; Sense of Space; Social Interactions; Physical space; Coffeehouses.

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1. Introduction

People used to be relaxing in public spaces reading newspapers or books. The scene has changed these days; people are getting more engaged with their smartphones or tablets. Digital had become a part of people's lives and this trend is set to continue. As Erving Goffman noted, social situations vary, and individuals' reactions depend on how much the individual is obliged to be in connection with what is going around him and the social context in which he is embedded [1]. This argument is even more relevant today with the Digital Communication Devices (DCD), which happens to blur the lines between physical and virtual space [2]. Nowadays individuals have the power to construct their personal space with varied tools. In this sense, mobile phone users imagine themselves able to communicate beyond the crowd as well as with it [3]. Focusing on encounters in public spaces, the paper elaborates on the way mobile phone users (basic mobile phones and smartphones) act in public spaces. Its argument is twofold: first, mobile phones contribute to the development of a sense of place according to personal privacy and awareness of surroundings. Second, how the use of DCD affects face-to-face conversations in public spaces. Third places were defined as social gathering places [4], the study will assess the extent to which the traditional function of coffeehouses as a place for social engagement still exists in the digital age. Moreover, it explores the phenomenon of using DCD and its influence on social interactions within coffeehouses. It also aims to find out the ability to share moments on DCD among patrons and the applications that they could share. The review of literature will focus primarily on the sense of place and social interactions inside coffeehouses in the age of technology.

1.1. *DCD and sense of place*

In 2003, Mitchell argued that technology superimposed over the physical world and blurred the line between real and virtual environments. A new type of space emerged where communication shifted from face-to-face, into digital medium communication [5]. Because of this type of communication, perceptions and reactions are no longer automatically perceived but interpreted while seen. Nowadays the Internet represents the backbone of global communication [6]. Today, Digital Communication Devices (DCD) together with the Internet covers the whole world, reaching most age groups of both genders. While the sense of social action is defined as the sense of presence with potential interaction partners [7], there is a loop of interactions that get created when visual contact is established. Social media is turning to be a big part of contemporary life. New socio-spatial practices have emerged, both on a collective level (flash mobs, the use of DCD in various political uprisings and riots, bikes and car-sharing programs) and on individual (e.g. using navigation systems, smartphone could be used to spontaneous meetings with friends or strangers, posting private photos or problems in school, etc.) [8]. Using DCD in public spaces (third places) is becoming a common feature of this era. DCD was often studied in the context of how modern communication technologies affect the interaction between people and society [9, 10, 11]. Recently, more studies are devoted to the negative aspects of virtual interaction [8,12]. Field studies in organizational environments have shown the extent of the fragmentation of knowledge workers' routines caused by information and communication technologies [13, 14, 15]. As a routine, workers check for new e-mail every 5 to 15 minutes [16]. They switch between multiple tasks so often and deal with many interruptions and information streams, disrupting their thoughts, weakening their memory, increasing error proneness, impeding understanding and inhibiting their capacity for deep thought, concentration, critical analysis and imagination

[17, 18, 19, 20].

1.2. *Evolution of space and place*

Traditionally, space is defined as a physical structure in which spatial, social or temporal objects could be arranged. Space is a container for activities in addition to cultural and aesthetic expressions [21]. In 1981, space was defined as: "the pattern of reactions that a setting stimulates a person". Sense of place, according to Steel is an international concept. It is developed from a dynamic and complex interaction between humans and the environment. It includes the physical setting such as furniture, trees, and other physical objects together with a social setting that exists in the space and activities taking place [22]. In physical life, space and time are major dimensions. Castells defines space of flows as 'hyperspace articulates ten dimensions including time; therefore, space organizes time in the network society' [23, 24]. Advancements in telecommunication technology made it easy for people to work from remote places away from the office desk. Many other social and cultural domains are shaped into person-based electronic communication. There is an increased number of people who work and manage services from their homes while in 1993 the survey of the European Foundation for the Improvement of Living and Working Conditions indicates [25]. The result of development in these areas is the same: 'Overlaying the physical space with the dynamic data'. This additional data layer is changing relationships between people and the spaces they inhabit and this will, in turn, impact the shape and development of public space [26]. Therefore, "Home Centeredness" became an important trend today. This does not mean the end of the city, like schools, workplaces, consumer services, commercial streets, recreational areas, shopping centers, sports stadium still exist and are expected to be there for a fairly long time and people will keep shuttling between such places with growing mobility due to the newly acquired looseness of working arrangements and social networks.

1.3. *Privatization and isolation of spaces*

The size of individuals' networks varies greatly. The internet affected the social form of communication between individuals, families and friends' groups [27, 8]. The more the use of the Internet the less the communication with family members becomes, together with a decline in size of the participants; social circle which is associated with an increase in their depression and loneliness [28]. Virtual Communities reinforce the trend towards "Privatization of Sociability" [29]. With constant use of social technologies, fewer people are communicating in person [29]. Many people are becoming more isolated and get into a personal private bubble. It is becoming easier to live with less personal confrontation and conversations. This trend developed adults who function well through a keyboard while failing at human interaction [30]. According to Geser in 2006, it was found that a large proportion of couples repeatedly interrupt their meals to check for text or voice messages while eating together [31]. Similarly, Humphreys found, in a year-long observational study on mobile phone use in public places, that people rarely ever used their phones to make a call [32]. In the digital age, according to Asaf Bar-Tura "contemporary coffeehouses have become a place of common isolation. A place to be alone together", they are now either working or studying [33]. Most often they seem to play with their phones, checked to see if they are "on" or "off" or checked for messages. In an in-depth observational study of coffeehouse patrons preceding this field experiment, it was found that, on average, many individuals in pairs or

small groups checked their phones 3 to 5 minutes regardless of whether it rang or buzzed, often held their phones, or placed them on table in front of them [34]. Recent studies have found that a large percentage of individuals experience what has been termed as the "phantom vibration syndrome" –perceived vibrations from a device that is not really vibrating [35]. Public privatism of interactions resulting from the use of cellular phones reflects the conclusions of studies of the way fixed internet access has been used in semi-public spaces: 'Private Uses in Public Spaces' [36]. People tend to socialize in intimate small groups in private homes rather than with large diverse groups in public spaces. This trend is enhanced using new mobile media with an inclination to socialize with small intimate groups in any space at any time.

1.4. Sense of place in coffeehouses in the digital era

Coffeehouses, third places promote social engagement between friends and acquaintances [37]. They are neutral grounds where patrons feel equal. Regular patronage gives the place its character. The mobile phone is a time management tool [38]. It increases the productive use of time. Nowadays, it is noticed that the separation of time between home and work is not that obvious. The office is not that confined place anymore. The availability of Wi-Fi in coffeehouses made it possible to extend coffee breaks into work sessions. A worker can work flexible hours from any other place than the office as home and coffeehouses. While attachment to a place is a set of feelings that emotionally binds people to a place, "Places root us to the earth, to our own history and memories, to our families and the larger community" [39]. People and places interact together to form the experience. It is important to remember that group, families, community members and even entire cultures often collectively share an attachment to various places [40, 41]. Although the perspective of Moos and Lemke is based on the general principle that the way one perceives the environment tends to influence the way one will behave in that environment. At the same time, there is emerging literature documenting mobile technology's negative impact on interpersonal communication and particularly face-to-face communication [42, 12]. Shalini Misra and others found the very sight of a mobile phone on a desk affected the quality of a conversation between two people [11]. Also, DCD affect the visibility of patrons to the surroundings, which may affect sense of the physical place [43]. The findings will assess the extent to which coffeehouses' traditional function as a place for social engagement exists in the digital age.

1.5. Social interaction and behavior preferences in the coffeehouses

Social interactions in public settings are related to an inherent need to establish a personal territory that allows people to regulate their contact with others ensuring privacy and security [44]. The need for privacy and related territorial behavior varies according to conditions and circumstances. For settings that are occupied for a short time, patrons often chose architectural features such as walls or columns to define their territory [45]. Once a group's territory is defined the positioning of individuals within that group also affects behavior. One seating configuration is more conducive to conversations [46]. Although the present era is called the digital era, yet coffeehouses are still placing where people come together to converse and communicate. But Asaf Bar-Tura suggests that instead of being places for interaction, contemporary coffeehouses have become places of common isolation. A study conducted on Boston coffeehouses [33] concluded that patrons work on their laptops, tablets or phones as well as socialize. Mobile phones and laptops were rare when Oldenburg developed his definitions

of third place [4]. The emergence of electronic devices allows for a virtual connection that now dominates communication. It is common to see people who choose to engage with social media rather than talk to people in a café. The use of communication technology like mobile phones in physical places isolates people [47], and some cultures even prefer the use of new technology over physical contact with other persons [9]. Gadgets and communication technology give virtual space for people to interact with each other, but people still need physical contacts and a coffeehouse offers an ability to transform online space into an offline space [48, 49].

2. Materials and methods

2.1. Case study selection

The concept of a typical coffeehouse in the Ottoman era, the origin of coffeehouses was a place where coffee beverages and the like were sold and at the same time providing a venue for relaxation and socialization. Coffeehouses described as being a more inclusive version of the previously important "aristocratic salons", where art and literature were discussed [50]. Later, coffeehouses started to appear in the city of Cairo sometime during the 16th century [51]. The architecture of early form of coffeehouses consisted typically of small simple stores that open to the street usually having façades ornamented with wooden arches. The usual seating consisted of raised seats or "mastabahs" in front of the shop and on two or three sides of the internal space. Such coffeehouses were exclusively in male settings. Men used to go there to smoke water pipes (shisha or hobble babble) as well as drinking coffee [52]. Those coffeehouses were named after the name of the drink itself in Arabic "Qahwa". This era came to an end with the advent of radio. Radio set became one of the most important features of the traditional coffeehouse. It provided coffeehouses' patrons with entertainment and a source of news [51]. Then television came in to replace the radio. Watching soccer games and television series became a major entertaining aspect for traditional coffeehouse patrons [53, 54]. By the time, Cairo became a place where Globalization could be taken as a sign of elite status [55]. By mid-nineties of the last century, local Starbucks-like coffeehouses such as Cilantro and Harris Café sprang out in Cairo. This took place a few years before the implementation of Starbucks and other international chains. Starbucks Middle-East franchise launched its branches in Egypt in 2006. This type of coffeehouses has started in the United States of America and has also been localized elsewhere [56]. Three coffeehouses were selected in Cairo to represent different types of coffeehouses. Starbucks coffeehouse (coffeehouse one; SB) and Espresso Lab (coffeehouse two; EL) were selected to represent globalized coffeehouses, also they met the criteria of coffeehouse as third-place [4]. Moreover, they maintain the development of technology needs. A traditional coffeehouse called Qahwet ElOmda (coffeehouse three; QE) was selected as it refers to a traditional coffeehouse (Qahwa). The three coffeehouses selected for the study are within the Maadi area, Cairo Governorate, Egypt.

2.2. Data collection method

The mixed-design methodology selected for this research included the techniques of visual documentation, observation, questionnaires, and interviews. The focus on the traditional nature of the person-environment connection required a description of the flow and dynamics of events. It was important to note what patrons were doing, thinking, behaving as well as the static conditions.

2.2.1. Visual instruments

The study began with the collection of information on the physical characteristics of each coffeehouse including the location, and both the architectural and design attributes. The layout of any coffeehouse is influenced by several factors such as the original purpose of the building, size, and shape of the space, availability, and location of windows, view, available seating and the location of the coffee bar and service areas [57]. A checklist of architectural features served as an instrument to frame the collection of such details. According to the list that was developed by Lisa Waxman for the framework of the ideal coffeehouse [57], the architectural features of the coffeehouse exterior were noted as well as its location relative to major roads, access to nearby shops, parking availability, etc. The interior architecture e.g. ceiling height, colors, finish materials, furniture type, natural and artificial lighting, location of electrical outlets, views, availability of outside seating, mobility of furniture and availability of speakers were also observed. Exterior and interior photos were taken and used as visual documentation.

2.2.2. Observation sessions

Observation sessions helped to understand the way coffeehouses are used and how design is related to activities that take place in the space. Prior to such sessions, floor plans were drawn denoting walls, windows, doors furniture placement, service areas, etc. Each coffeehouse was observed for 12 hours on different days and at different times of the day. The behavior of patrons was documented with 126 patrons involved. During each observation session, a floor plan was used to denote occupied seats. Detailed field notes outlining the activities of patrons were also recorded. Each patron was assigned a letter on the floor plan which corresponded with the same letter noted in the field notes. All observation notes were typed for use in coding the data with the corresponding floor plans for later use.

2.2.3. Questionnaire's design

To better understand the preferences of patrons, surveys were performed on the three coffeehouses. Sixty questionnaire sheets were completed out of sixty-three, only three patrons declined to participate, twenty in each cafeteria. The survey respondents can be considered as nonrandom purposive samples. In each of the three coffeehouses, approximately six survey participants were chosen in the morning, six around midday and eight in the evening. It was considered important to survey patrons at various times of the day because of the variation of the social climate in coffeehouses during different timeframes. A purpose design survey was used, the questionnaire was designed to include different types of questions; rating responses, deferential questions, and multiple choice. The survey consists of two parts and included both close-ended and open-ended questions. The first part of the survey asked patrons to evaluate the characteristics of coffeehouse they patronize, while the second part asked about the use of DCD inside the coffeehouse and how they use their mobile phones while lingering with others. Questions regarding the characteristics of the place aimed to identify highly valued attributes and even the missing ones. The survey included questions about the location of the coffeehouse, how patrons get there, their preferred seat location, acoustics, lighting, ambient conditions and their socialization habits in the coffeehouse. To better understand the way people, communicate in coffeehouses, questions about

ways of communication were asked. Other questions were about patrons' awareness and feel of privacy while using DCD in the place and the ability to share moments. There were also questions addressing the effect of the number of patrons on the dedication to DCD. Finally, open-ended questions addressed participants' feeling about the face-to-face interaction and to what extent does the DCD affect it.

2.3. Interview sessions

To further understand patrons' feelings when using DCD in the presence of others in coffeehouses and the meaning such places hold for patrons, interviews were conducted. To get a variety of perspectives, 12 interviews were held, 6 with patrons, 3 with employees and 3 with either the owner or manager of the place. The interviews were conducted in the coffeehouses, lasted for about 40 minutes each and recorded with notes transcribed for later use in the coding of data.

2.4. Findings

The findings are to be broken down into characteristics of the coffeehouse, characteristics of seating relating to types of activities and how DCD affects both. Then the aim and the problems will be addressed and discussed with the four research questions.

3. Results

3.1. Characteristics of the coffeehouses

3.1.1. Coffeehouse one, Starbucks (SB)

SB (see figure 1) is an international chain coffeehouse, located on a busy intersection at the entrance of the suburb of Maadi, located in ElNasr Street, Ezbet Fahmy, Maadi, Cairo Governorate. SB is on lifted ground floor level, formed from one level divided into indoor and outdoor places. Seating in this coffeehouse is uniform with many round wooden tables with laminated tops, hosting two to four patrons. The chairs are wooden ones with vinyl seat covers. A leather sofa, two large leather chairs, and high round tables are also available. The floors are covered with ceramic tiles. Colors are predominately warm with brown walls; wood cladding surrounds the coffee service



Figure 1: Starbucks coffeehouse (SB) in Maadi, Egypt.

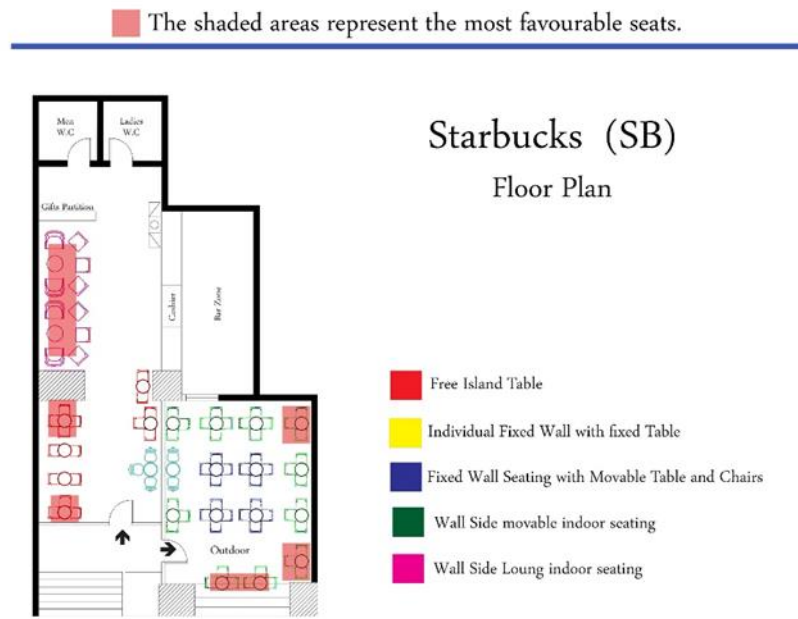


Figure 2: SB floor plan for seating arrangements.

area and wooden table and chairs. Paintings are hung on several walls. Natural light pours in from the facing windows (see figure 2). The view includes a parking lot, a view of several shops next door and a major highway "ElNasr Street".

3.1.2. *Coffeehouse two, Espresso Lab (EL)*

EL (see figure 3) is a branch of an international chain that was recently opened in Egypt and located in Assarayat Al Gharbeyah Street, Maadi, Cairo Governorate. It is a self-service type venue and serves as an example of an

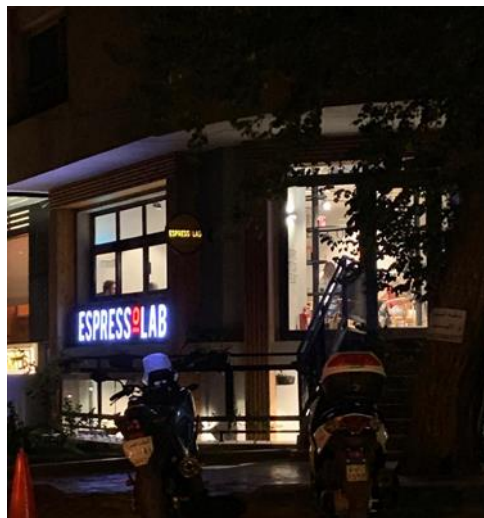


Figure 3: Espresso Lab (EL) coffeehouse in Maadi, Egypt.

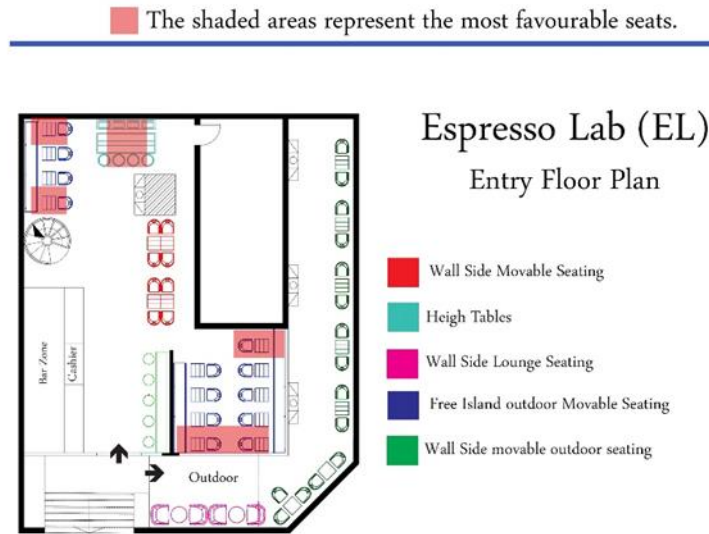


Figure 4: EL Floor Plan for seating arrangements.

optimally functioning coffeehouse. It is formed of two floors, half basement floor, and lifted ground floor (see figure 4). The main entrance and bar area are on the basement floor. It incorporates several design elements including high ceilings and windows that look out onto a garden. Modern furniture allows for further flexibility. The chairs are made of wood and steel. They are also capable of being reclined according to the customer's preference and virtually weightless permitting customers to move them easily. Electric power sockets are provided either on the interior wall or on some furniture.

3.1.3. *Coffeehouse three Qahwet ElOmda (QE)*

The QE is a locally owned coffeehouse, located in a crowded area, in Abd El-Moneim Riad Street, Ezbet Gabriel, Maadi, Cairo Governorate. QE is located on a ground floor and occupies a front yard of an apartment building while both the sidewalk and the street represent the outdoor space. Some trees grow in the indoor area. The indoor place was built on the extension of the building; that supposed to be a garden for the ground floor level (see figure 5). The owner of the coffeehouse decided to keep the old trees in this area and built the place surrounding them. There are some openings in the ceiling to give the trees space to grow and a share of air and sunlight. The outer walls of the shop are not fully masonry closed as there are arched openings that get closed in case of cold weather. QE has two entrances (see figure 6). The main one is on the corner of the coffeehouse while there is a smaller entrance on the long edge. A wooden partition is located next to the main entrance. Some plastic chairs and round tables are arranged along the walls. The existence of trees does not allow furniture to be arranged in a grid pattern. There are three T.V screens for patrons to watch.



Figure 5: Qahwet ElOmda (QE) coffeehouse in Maadi, Egypt.

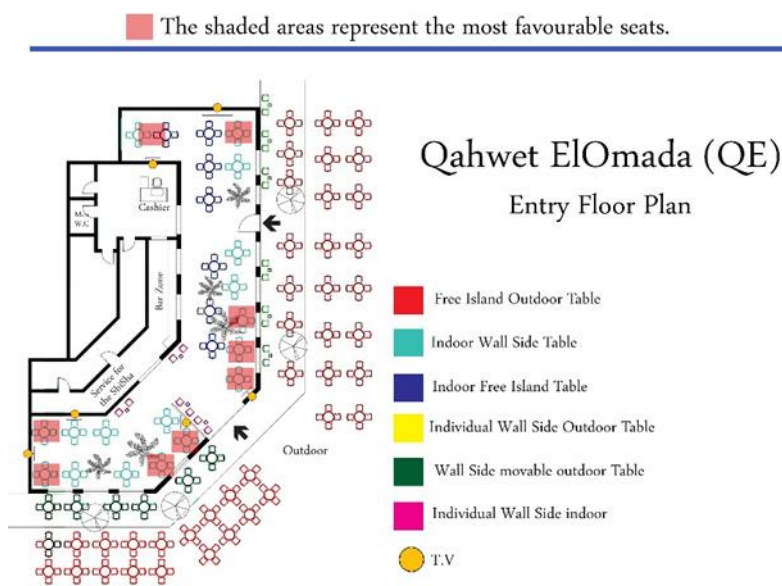


Figure 6: QE floor plan for seating arrangements.

3.2. *Layout and seat selection*

The first layout issue to be discussed is how the interior space and arrangement of furniture relate to seating preferences to patrons. During observation sessions, the seating preferred by patrons was noted and the seats that are used before others and those which are more frequently occupied were considered the most desirable. In SB, the favorite seats were sheltered somewhat due to their placement along walls, or next to the edge of the second-floor level, which, essentially, created a partial wall see figure (2). The only preferred seat not sheltered by some architectural feature was the lone upholstered chair, reported to be the only comfortable chair in the coffee shop. This upholstered chair was frequently moved by patrons to accommodate their preferences. In EL, see figure (4), all the favorite seats except one were also sheltered against walls or the counter. In QE, see figure (6), the seats along the walls were the first choice while corner seats were ranked second. Data showed that seats near windows, walls and partial walls were most frequently selected. Patrons were clearly drawn to sheltered seats; those with architectural elements that offered a physical structure on, at least, one side (see figures 2, 4

and 6). Sheltered seats were placed up against walls, windows, or level changes that provided a partial sort of wall. Seats in a corner with shelter on two sides were most frequently selected in the two of the three coffee shops. Interviews with patrons revealed that they felt an element of protection when sitting against a wall or other fixed architectural elements. In addition, they enjoyed the opportunity to watch other people come and go; therefore, seats near a window, protected on at least one side but with a view to much of the interior, particularly the entry and exit doors, were viewed as more desirable. There were also practical aspects of seat selection. For many patrons with specific tasks to perform, seats were selected in a way that helped them accomplish those tasks. Seats near electrical power sockets for plugging in laptops or adequate lighting for reading were often chosen by those with work to do. For groups, the size of the table and the ability to put more than one table together also influenced seat selection.

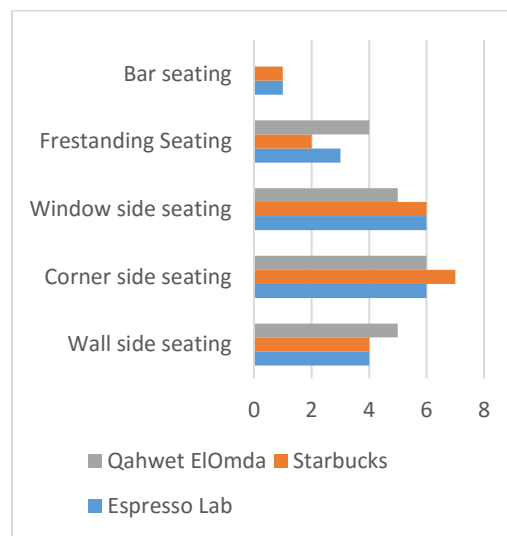


Figure 7: Seating's preferences in the 3 coffeehouses.

According to observation (see figure 7), there were preferable places that were more frequently occupied. Corner places are the most used. Patrons like to sit on the seats backing wall. Throughout the whole observation, it was noticed that some patrons may wait for either a corner table or a wall-side table. They either wait for standing or sitting at any table until a favorable table is vacated. In coffeehouses 1 and 2, there was an ample supply of power points that encourages patrons to sit around the edge to charge their DCD.

3.3. *Patrons' activities*

Observation shows that teenagers and people around twenties seem to like EL more than grownups. Morning hours seem to be favored by older patrons. It has been noticed that between 10 am and 1 pm, in the three coffeehouses, more people above 50 years come to the place for breakfast. If they are alone, they usually read a book or newspapers or they may use their mobile phones. If they are accompanied by others they tend to chat through the meal. By 1 pm teenagers and other adults start to appear and the place becomes crowded. In SB and EL Individual patrons like to be next to a wall where electrical power sockets are located, patrons in QE care more about shaded areas. In SB and EL Patrons who like to read or write go for corner seating. Couples usually sit facing one another and if both are using laptops, they seem to be so isolated. If they sit side by side

there is a better chance for talking and communicating, while patrons of QE were less in using laptops.

Around 3 pm the place becomes busier, and groups of 3 or more appear in the three coffeehouses. In SB and EL, it seems that groups of female patrons tend to come to the place to play on their DCDs more than it happens with male patrons, while in QE teenagers like to play with their mobile phone. Around 5 pm, in SB and EL groups of more than three and families start to come in. In SB there were some children seen accompanying their parents because smoking is prohibited indoors. After 5 pm the outdoor area seems to be fully occupied and in QE, the staff furnishes and arrange to a seat. In SB and EL, lounge chairs are favored by patrons particularly if they do not have the intention of using laptops. Patrons may use their DCD as there is a lack of entertainment offered by the place. In the three coffeehouses, larger size groups are usually seen from 8 pm to 10 pm and they occupy the middle of the space using more than one table if they are not interested in having electrical power sockets close by. Although in SB and EL there were some patrons intended to use their laptops, they adjust their seating near to electrical power sockets. The results also showed that the most favorable activity shared by the three coffeehouses, as shown in figure (8) is having a beverage. Using Wi-Fi is the second favorite activity in SB and EL but still more popular in EL. In QE most of the patrons who asked about the availability of Wi-Fi were teenagers. In EL, patrons come to this coffeehouse for the purpose of meeting friends, studying, working or having a drink. Eating as an activity is rated fifth. In SB, eating is rated as the third purpose. The place is reputed for serving good beverages and foodstuffs. Couples enjoy spending the evening in the place while family gatherings usually occur around midday. Several patrons like to have a break from their work at SB. In the case of EL such patrons are less in number. In QE the patrons who come to meet friends form a majority. They vary in age but they are all males. Coming to the place for a break from work is rated as a third activity. Despite that the place does not serve food, some patrons bring their food from outside and consume it in the cafeteria. Watching T.V. is a pretty popular activity in QE particularly if there is an important soccer game of popular drama series is broadcasted. Playing board games e.g. chess and backgammon is another well-liked activity. Digital games were played in the three coffeehouses, where QE came first followed by EL and SB fell behind. Some patrons of QE indicated that they come to the place to smoke shisha "Hubble bubble".

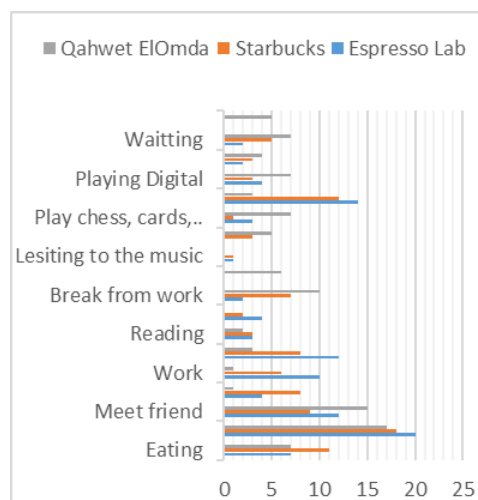


Figure 8: Activities' preferences in the selected three coffeehouses.

3.4. The use of DCD in coffeehouses

Table 1: The differences between percentages face-to-face and DCD conversations.

	Face to Face	Via DCD	Total
SB	14	6	20
EL	18	2	20
QE	12	8	20
Total	44	16	60
Percent	73.33%	26.67%	100%

Table (1) shows the percentage of patrons who prefer face-to-face communication with families and friends rather than using DCD. Espresso Lab sample almost totally agrees that face-to-face communication is a better way to communicate. In the three coffeehouses, patrons were in favor of 73.33% of face-to-face contact and 26.67% were in favor of DCD. According to this result, patron like to have face to face conversation while they are in coffeehouses. Through interviews, patrons who prefer face-to-face communication justify their liking by saying that there are more feelings in the conversations through face-to-face communication. On the other hand, those who favored the use of DCD stated that it is easier to reach more people.

Table 2: The percentages of multiples use of DCD.

	Once	Twice	3 – 5 times	More than 5 times	Total
SB	3	5	6	6	20
EL	2	5	5	8	20
QE	1	2	9	8	20
Total	6	12	20	22	60
Percent	10.00%	20.00%	33.33%	36.67%	100%

The data in the table (2) shows that although people like to have face-to-face conversations, yet they may use their DCD many times while they are with friends and family in coffeehouses. 36.67% use DCD more than five times and 33.33% use DCD from three to five times. The activity of using DCD can be clear inside the coffeehouses; patrons either use DCD for long time or at least once or twice. The table also shows that patrons in QE use their mobile phones a lot while they are accompanied by others in the place. Patrons who use mobile phones while they are with friends in coffeehouses, probably use the phone for Web surfing.

Table 3: The distribution and percentage for activities to do on DCD.

	Boring	Walk	Play	Check Mail	Web Surfing	Other	Total
SB	1	1	2	2	14	0	20
EL	1	1	5	1	12	0	20
QE	3	0	6	0	11	0	20
Total	5	2	13	3	37	0	60
Percent	8.33%	3.33%	21.67%	5.00%	61.67%	0.00%	100

The presence of the Wi-Fi inside the three coffeehouses allowed patrons to surfing through the internet. The presence of internet provides several activities to do online. It was found that 61.67% of the total sample are Web surfing. According to the virtual communities, DCDs are the communication medium, although it is also shown in table (3) that 21.67% use the phone to play games. Playing activity on DCD were favorite for the teenagers inside the three coffeehouses; teenager patrons play together online through their DCDs while they were in the place. The percentage of patrons who use mobiles for work purposes amounts to 3.33% for working activity and those were more in SB and EL as the environment and the availability of electrical power sockets motivate such activity. While 8.33% using their DCD to get out of boring; the use of DCD with the presence of the internet can change the mode by scrolling and surfing.

Table 4: The rate of agreement for sharing moments from DCD with patrons.

	Never agree	Don't agree	Neutral	Agree	Sure Agree	Total
SB	0	2	5	8	5	20
EL	0	1	4	10	5	20
QE	0	1	4	9	6	20
Total	0	4	13	27	16	60
Percent	0%	16.67%	66.67%	45%	26%	100.00%

Although patrons of coffeehouses like to play games or use the Internet for Web surfing, the idea of sharing moments with friends attracted 71% of them, table (4). Patrons feel that the DCD is something personal especially mobile phones. But on the other hand, patrons like to share funny videos and images but a smaller percentage disagreed on the idea of sharing. Patrons saw that by share something from the screen with their friend rich their gathering.

3.5. *Impact of using DCD on social interactions in coffeehouses*

Table 5: The percentages of the relation between the more times of DCD with the number of participants.

	One Person	Two Person	Three to Four Persons	More than Four Person	Total
SB	1	1	12	6	20
EL	3	2	10	5	20
QE	4	3	9	4	20
Total	8	6	31	15	60
Percent	13.33%	10.00%	51.67%	25%	100%

Patrons like to use mobile phones if they are in groups of three to four (51.67%), table (5). If in groups of more than four patrons the percentage is 25.0%. In the three coffeehouses, 10.0% think that they do not use the phone a lot if they are in a group of three as they consider it to be an inconsiderate action. In couples, 13.33% may use a mobile phone. According to the interviews, the more use of DCD appears when more patrons are gathering. In groups of more than three, patrons start to use DCD when others tend to side talks. During the side talks, other patrons try to get involved in the cyber space searching to another mediated interaction.

Table 6: The rate of agreement on using DCD gives more privacy in the coffeehouses.

	Never agree	Don't agree	Neutral	Agree	Sure Agree	Total
SB	0	2	7	9	2	20
EL	1	3	5	8	3	20
QE	2	5	9	3	1	20
Total	3	10	21	20	6	60
Percent	5.00%	16.67%	35.00%	33.33%	10.00%	100%

According to the results, 43.33% of the patrons feel more private when using their mobile phones inside a coffeehouse, 35% were neutral, table (6). The lowest percentage of 21.67% did not care about privacy. Starbucks patrons came first regarding privacy as a feeling to use mobile phones in the place. QE patrons were the most indifferent about the matter of privacy while using mobiles. Patrons use DCD as a virtual private space when they feel uncomfortable in the physical place. The idea of a portable personal tool automatic provides virtual private space in the physical one. Individual patrons were the more use of DCD; patrons enter the virtual space which heals the privacy of the physical space.

Table 7: The rate of agreement that using DCD loses contact with the physical surroundings.

	Never agree	Don't agree	Neutral	Agree	Sure Agree	Total
SB	6	7	4	2	4	20
EL	5	6	4	1	1	20
QE	3	5	5	5	2	20
Total	14	18	13	8	7	60
Percent	23.33%	30.00%	21.67%	13.33%	11.67%	100%

Data in the table (7), shows that 53.33% of patrons in coffeehouses lose contact with their surroundings if they use their mobile phones, 25% maintained their contact with space and 21.67% were indecisive. According to the results, the sense of place gets blurred while using DCDs in the coffeehouses. Patrons can not recognize the surrounding from waiters or other patrons. While in the interview patrons described DCD by “the screen attracts all the attention”; the activity that do in the cyber space affect the level of awareness. According to this, mediated interactions especially the online ones affect the attention in the physical space.

4. Conclusion

Physical social interactions have always been key categories in understanding the dynamics in public space. Today, however, with the development of social media and the significant role of social behavior according to the sense of place have become central to examining the means by which people present themselves and at least partially manage their behaviors [7]. The results of the experiment showed that patrons have difficulty defining

the sense of place according to their awareness to the physical space while using DCD in public space, but in the same time, people are extremely aware of the notion of visibility in public as well as of the norms and regulations practiced in public space. Support the idea of Hybrid space and the flows of information through the virtual space, patrons considered virtual space to be an additional layer of public space, a space where they can project themselves through mediation communications, whereas public space is considered to be a place where the individual is exposed, to others without control [29,26]. Furthermore, as noted in the introduction, privacy became a virtual bubble formed while using DCD. Today virtual space allowed people to extend to anywhere without limit. On the other hand, the findings related to Cheng when he mentioned that, when people use their DCD for a long time, they lose contact with their surroundings [27, 43]. This is surely not new; rather, what we are witnessing as observed in this study is the normalization of this social process with individuals willing to contribute information, especially regarding the activities that they perceive to be in public. Physical conditions of a coffeehouse such as seating arrangement show neutrality as well as offering flexible spaces for different kinds of interactions which support the idea of the ideal coffeehouse [57]. The presence of outer views and entertainment elements as T.V. and physical games reduce the time spent on DCD in the Traditional coffeehouse; QE does not maintain working activities but sustains conversation activity among patrons. Characteristics of third places outlined by Oldenburg have been developed and changed especially in relation to modern culture and communication technology [49]. According to Misra and Genevie, Modern coffeehouses like SB or EL do not primarily encourage social interactions between strangers but try to accommodate the needs of patrons such as relaxing, working and holding multiple conversations through social media. The presence of Wi-Fi and electricity power points means more use of DCDs [34]. This was demonstrated in the case of EL where using laptops was clearly more than it is in other coffeehouses. Patrons usually have the intention to use their DCD when they come alone or with whom they converse with. Couples who sit facing each other used DCD less than those who sit beside each other without using laptops. Although the finding support Emily Drago when she mentioned that DCD negatively affect the face-to-face conversation, but the conversation is still the main activity at third places [8].

5. Limitations and recommendations

The study was limited to three coffeehouses in one neighborhood. The study needs to test the physical settings and its direct impact on the use of DCD in several neighborhoods with different cultural. For further research, experimental study on coffeehouses that prevent the Wi-Fi needed; coffeehouses without internet, to see the differences on face-to-face interactions without DCDs. Further studies are sought to consider the social and physical characteristics that enhance patrons' experiences. The design of third places should promote comfort, sense of belonging and the bond between people and place and simultaneously consider the rise of technologies and their effects. More researches and studies needed to explore a phenomenon that develop every day; cellphone as a DCD is with everyone. Technology is developing in a way that the physical space gets blurred. Architects and Interior designers need data about people's behavior in public spaces. Physical design needs to respect the technology development to maintain coffeehouses as places for physical social interactions.

6. Competing interests

The authors have no competing interests to declare.

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7. List of Tables

Table 1. The differences between percentages face-to-face and DCD conversations	13
Table 2. The percentages of multiples use of DCD	13
Table 3. The distribution and percentage for activities to do on DCD	13
Table 4. The rate of agreement for sharing moments from DCD with patrons	14
Table 5. The percentages of the relation between the more times of DCD with the number of participants	14
Table 6. The rate of agreement on using DCD gives more privacy in the coffeehouses	14
Table 7. The rate of agreement that using DCD loses contact with the physical surroundings	15

8. List of Figures

Figure 1. Starbucks coffeehouse (SB) in Maadi, Egypt.....	7
Figure 2. SB Floor Plan for seating arrangements	7
Figure 3. Espresso Lab (EL) coffeehouse in Maadi, Egypt	8
Figure 4. EL Floor Plan for seating arrangements	8
Figure 5. Qahwet ElOmda (QE) coffeehouse in Maadi, Egypt	9
Figure 6. QE Floor Plan for seating arrangements	9
Figure 7. Seating's preferences in the 3 coffeehouses	11
Figure 8. Activities' preferences in the selected three coffeehouses	12