CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Sustainability is defined as improving the quality of human life while living within the carrying capacity of supporting eco-systems. (International Union for Conservation of Nature and Natural Resources, United Nations Environment Programme, World Wide Fund for Nature, 1991) Often viewed as an all encompassing and lofty concept, sustainability can be an achievable goal that combines economic, social and environmental aspects of development to work to achieve an environment that promotes the economy, preserves the environment, and enhances the quality of life without compromising the needs of the future generations. With the oil crisis in the mid-1980's, there was a realization of an interconnectedness of the various factors involved in the environment. An outside-inside relationship and approach was recognized. This sparked scientific and design approaches towards a holistic solution.

Sustainable urban design has at its heart the provision of a comfortable outdoor for city dwellers alongside proper provision of public services, regulation of urban density and efficiency of public transportation. Comfortable urban spaces contribute to improved quality of life. One of the primary objectives of environmental design in the urban context is the creation of the urban block with comfortable open spaces. (Nikolopoulou, Lykoudis, Kikira, 2004) Providing a comfortable open space improves the quality of life for the city dwellers.

Given a comfortable outdoor microclimate, people have added opportunities to carry out different activities such as leisure, exercise, or other forms of recreation. A comfortable outdoors also enhances one's experience when using urban elements such as pedestrian paths, parks and public transportation facilities, to name a few. Comfortable urban spaces are also good places for social interaction, thus directly decreasing instances of social exclusion and isolation. In terms of economics, many recreational activities of considerable economic value are conducted outdoors like sporting activities, al fresco dining and staying in café concessions.

Smith (2005) considers the following questions on comfort and significance among others in his Environmental Checklist for Development:

1. Will the development achieve optimum standards of comfort for its inhabitants?
2. Does the proposed development make a significant contribution to the economic and social well-being of the community?

(Smith, 2005, page 266)

He further identifies one of the key indicators for sustainable design as whether a development creates an external environment that is both a visual amenity and offers environmental benefits such as summer shading from trees, and evaporative cooling from water features. In simpler terms, a successful outdoor design is one which looks good to people and one they want to spend time in because they are comfortable.

Thermal comfort is the study of the relationship between a person's sensation of warmth or cold and the thermal condition that creates the sensation. In layman's terms, "thermal comfort" is a feeling that is usually noticed more by its absence. People are much more likely to notice thermal discomfort i.e. feeling too hot or too cold. (Parsons, 2003)

Roaf (2004) considers thermal comfort as one of the social indicators for sustainable development. Along side issues of energy and climate change, that of thermal comfort touches on the social aspect of sustainability wherein proper design for outdoor thermal comfort in cities can lead to improved health and well-being of the people. This brings about an improved quality of life without risking the environment – the heart of sustainability itself.

Agenda 21 by the United Nations Conference on Environment and Development (UNCED), presents a comprehensive plan of action to be taken globally, nationally and locally by member states and major groups in every area in which humans impact on the environment. This has been adapted by 178 countries including those in the Middle East. Chapter 6 of the document, Protecting and Promoting Human Health Conditions, recognizes the health problems due to urban sprawl and pollution in urbanized areas and calls for solutions outside the health sector. (United Nations, 1992) With these international agreements and campaigns to put sustainability into action, it would be constructive to discuss next the actions taken in different parts of the world.

In Europe, the European Union developed the 5^{th} Framework Programme 1998-2002 as its research arm to generate studies relevant to actualizing sustainability among their member countries. It has developed research programmes with four themes and one of them deals with energy, environment and sustainable development. Among the issues covered in the fourth theme are ‘making Europe's energy system, industry and society "eco-efficient", helping solve global environmental challenges, and reconciling economic development with environmental sustainability.’(European Union, 2009)

Research into Quality of Life (QOL) issues covers environment and health alongside food, nutrition, health and sustainable agriculture and fisheries. Roaf (2004) further explains that QOL is indirectly referred to in the European Union’s “Common Indicators for Sustainable Cities” as an indicator for “community” and for “availability of local public open spaces and services”. Access to public open spaces and basic services is essential for QOL and for the viability and sustainability of the local economy.

With regard to energy environment and sustainable development, a comprehensive study on outdoor urban thermal comfort was conducted by a team of researchers from different universities across Europe. The researchers recognize that there is strong public interest in the quality of open urban spaces and acknowledge that they can contribute to the quality of life within cities, or contrarily enhance isolation and social exclusion. These elements relate to the physical and social environment, the underlying hypothesis being that these conditions affect people's behaviour and usage of outdoor spaces. (Nikolopoulou et.al., 2004) This study will be discussed further in the review of related literature.

Outside Europe, there are other notable efforts to achieve outdoor thermal comfort in the urban setting. In the Middle Eastern region, the Urban Planning Council of Abu Dhabi developed the capital city's development framework plan called Plan Abu Dhabi 2030 – Urban Structure Framework Plan, September 2007. This document contains the Public Open Space Framework which identifies the hierarchy of open spaces in the city. In the outer ring of the city is undeveloped land that is defined by the Sand Belt to the east of the city and the National Park System to the northeast. Next to this is the 'City Park' which includes the Mangrove Park (urban wild), the Corniche (public water front) and Lulu Island (space for recreation, tourism and commemoration). At the next deeper level is a network of community parks and recreation spaces in the form of sports fields, playgrounds and landscaped squares. This network infuses local green spaces within the structure of the city thus creating a garden ambience. The next level is the continuous planted boulevards and byways connecting the community parks to each other under the shade of trees. The framework explains that this strategy is to ensure that the local streets are seen and used as public open spaces and not just traffic routes. At this level, the framework prescribes that parking spaces be located inside buildings or underground. The final deepest level is the open spaces associated with certain kinds of buildings like squares in front of government buildings and train stations to emphasize their importance. (Urban Planning Council, 2007) It also calls for comprehensive landscaping of mosques and other areas to ensure the coolest possible microclimate. However, no similar master plan exists for Dubai.

Murray (2003) maintains that Dubai has evolved at a breakneck speed, without a definitive masterplan. The Dubai Vision 2010, a general plan for development of Dubai, was more about defining goals (which were in some instances rather ambitious) than about strategies to achieve these goals in a realistic and solution-based manner.

Based on the recommendations of Agenda 21 (United Nations, 1992), Dubai then formulated its Dubai Strategic Plan 2015. Compared to the highly ambitious Dubai Vision 2010 presented earlier, the strategic plan calls for regulation and planning of Dubai developments. In its section The Infrastructure, Land and Environment, the strategic plan expressed its aim to maintain Dubai as a safe, clean, attractive and sustainable environment. The two relevant sub-aims in this chapter call for the alignment of environmental regulation with best practices and the development of required enforcement mechanisms for sustainable development. (HHS Al Maktoum, 2007) However, the strategic plan is still quite vague and calls for elaboration for it to be implemented at the physical level.

Private developments in Dubai put prime value on the presence of a comfortable outdoor environment even though this would seem artificial. This can be observed in the atrium corridors in the prominent malls of the city such as Dubai Festival City, Dubai Mall, Ibn Batuta Mall, Mercato Centre and Burjuman Centre. These developments try to recreate an outdoor ambience indoors which is easier to control thermally. Private residential developments also invest in creating garden outdoor areas where the residents can walk around and spend leisure time outside. However, this enthusiasm for development has yet to be translated into the city's public pedestrian outdoor areas.

There are current efforts in Dubai to provide pedestrian friendly areas like the beautification of Jumeirah Beach Road with provisions for biking lanes. A pedestrian strip of The Walk in Jumeirah Beach Residences is adjacent to commercial establishments making it popular to beach goers and those visiting the commercial establishments. However, these spots of pedestrian areas are few compared to the best practice situations in other countries with developed pedestrian areas. Currently, it can be observed that the design of public roads and streets give more priority to vehicle traffic than the walkability of pedestrians. It must be noted, that there are several parks and open spaces in Dubai like Zabeel Park, Safa Park and Jumeirah Beach Park, to name a few. These can be considered as good examples of open spaces within Dubai, however, they can be typically accessed by private vehicles, taxis and public transport. Comfortable pedestrian linkages between open spaces and several points of destination has yet to developed.

With the rapid development of cities in the Middle East, specifically Dubai in the United Arab Emirates, not much care has been given to provide a comfortable public outdoor environment. This has been overlooked on the grounds that the Middle East is a very hot and dry climate and closest most available areas for comfort are the controlled air-conditioned ones indoors.

Ahmed (2003) argues that successful design of a comfortable outdoors can lead to better indoor conditions with less demand for building cooling systems to maintain the ideal comfort indoor conditions. Since a building's cooling load is greatly affected by the outdoor conditions, an improvement in the outdoor conditions would definitely lead to more achievable and efficient control of the indoor environment.

Much care has to be given to the design of Dubai's urban outdoor spaces which can be used for long periods of the year. For this to happen, a better understanding of the dynamics of thermal comfort parameters in the context of the city is deemed vital.

1.2 Research Aims and Objectives

To address the problem of how to achieve sustainable outdoor thermal comfort in Dubai, this study aims to answer the following questions:

1. What outdoor environmental conditions would be thermally comfortable for pedestrian / commuters in the Middle East cities (specifically Dubai)?

2. What design strategies can be used in outdoor commuter / pedestrian spaces in Middle Eastern cities (specifically Dubai) to improve thermal comfort?

The objectives of this research are as follows:

1. To determine the outdoor thermal comfort zone for Dubai
2. To determine relationships between factors affecting thermal comfort in an urban outdoor space in a hot and dry climate
3. To provide recommendations for designing a thermally comfortable urban pedestrian space in a hot and dry climate

1.3 Scope, Limitations and Delimitation

The research focused on the thermal aspect of outdoor comfort in urban spaces, where the parameters considered were air temperature, radiant temperature, wind speed and humidity. The areas of concern were outdoor spaces used by pedestrians. The research considered the varying climate conditions in a given city with a hot and dry climate classification. Climate conditions were classified into three parts: hotter temperature range (summer season), cooler temperature range (winter season) and the mid-temperature range (autumn / spring).

Other issues of comfort such as lighting, visual impact, acoustics, safety and accessibility were not included in the focus of this research. The open urban areas being used by pedestrians and commuters considered were those adjacent to public transportation routes in commercial and residential districts.

Since the researcher can speak only English and her native tongue, the majority of the survey respondents were English speakers. These instances where she was able to communicate with a non-English speaking participant were fortunate and were when there was another person willing to translate English to other languages.

CHAPTER 2: LITERATURE REVIEW

2.1. Key concepts

This chapter provides basic definitions or explanations of the concepts needed in discussing thermal comfort. The first concept is thermal comfort in human beings followed by the processes involved and the components in the environment that affect it. Another important matter to understand is how the human body consciously and unconsciously regulates itself with regards to the thermal environment. It is necessary to map out the hierarchy of responses that the human body makes when subjected to extremes of heat and cold as well as the middle comfortable conditions.

Governed by physics, the human body in any given environment is in the process of a continuous exchange of heat between it and the thermal environment. The basic forms of heat transfer are conduction, radiation and convection. All of these occur within the body and between the body and the external environment following the zeroth law of thermodynamics. The guiding principle is that the body is programmed to maintain certain levels of temperature and humidity in order to perform its functions. Any departure from this set of criteria is deemed uncomfortable and the body takes the appropriate steps to return to its comfortable state.

2.1.1 Thermal Comfort

ASHRAE (1992) defines thermal comfort 'as a condition of mind that expresses satisfaction with the thermal environment.' In any given environment, the human body is subjected to external environmental factors combined with a demand from its body organs to maintain a narrow range of temperature for it to carry out its physiological processes. The combination of these external and internal factors continuously affects the conscious mind which then reaches a conclusion whether the body is in a state of comfort or discomfort.

In general, comfort occurs when body temperatures are held within narrow ranges, skin moisture is low, and the physiological effort of regulation is minimized. (ASHRAE, 1997) Regardless of location, thermal comfort is affected by the components of the external environment for each given situation. These physical components are air temperature, radiant temperature, relative humidity and wind velocity. Personal factors such as clothing and activity also affect a person's perception of his or her state of comfort or discomfort.

As discussed above, thermal comfort is a rather complex concept which is affected by more than one physical factor aside from the psychological aspect. As the human mind is not well designed to identify specifically and quantify each component affecting his or her state of comfort or discomfort at any given time (Toudert, 2005), research on understanding the reasons behind thermal comfort perception is not well developed (Parsons, 2003) The major inclination of studies in this field has been towards determining the conditions which provide thermal comfort.

Since it has been observed that thermal comfort affects a person's productivity, studies on thermal comfort in this area have been of active interest even before the twentieth century and up to the present in the pursuit of determining the conditions that would provide thermal comfort. With the demands of the Industrial Revolution, studies into thermal comfort to improve factory workers' productivity were taken into consideration alongside the research on efficiency of machines and systems. Instruments and tools to quantify thermal comfort were developed as well as models to predict comfort in a given environment. Most of these studies were based on achieving comfort in a controlled indoor environment therefore enabling air conditioning systems to be designed more efficiently today.

However, the situation is not the same for the number of studies conducted on thermal comfort in the outdoor setting. Research on urban (or outdoor) thermal comfort only started in the 1930's (with the initial task of determining the outdoor health effects of extreme weather). This is because of the complex issues of involved: spatial and temporal variability of environmental conditions, diverse range of activities and clothing patterns, and complex effects of buildings and vegetation on shading and ventilation. (Emmanuel, 2005)

2.1.2 Forms of Heat Transfer Related to Thermal Comfort

The fundamental forms of heat transfer are conduction, radiation, convection, and evaporation. These different forms of heat transfer occur between the skin and the thermal environment. Conduction is the transfer of energy from the more energetic particles of a substance to the adjacent less energetic ones as a result of interactions between the particles. It can take place in solids, liquids, or gases. (Çengel, 2003) With regards to thermal comfort, conduction occurs when the body comes into close contact with another surface and heat is exchanged due to their temperature differences. An example of this is sitting on a bench that has long been exposed to the heat. In this case, the body is at a lower temperature compared to the bench and would therefore obtain and feel heat from this surface. Heat from the ambient air in direct contact with the body is also another source of conduction. Another example is the transfer of body heat from the skin to the clothing that is defined by ASHRAE (1997) as part of sensible heat expelled from the skin.

Radiation is defined as 'the energy emitted by matter in the form of electromagnetic waves as a result of the changes in the electronic configurations of the atoms or molecules.' (Çengel, 2003) Simply defined, it is the transfer of heat energy through empty space. In an outdoor thermal environment, one of the main sources of radiation is the sun. Secondary sources are those emitted from the ground and neighbouring buildings which also absorbed solar radiation before hand. Standing directly under the sun, the body receives a significant amount of solar radiation as compared to being under the shade where main sources of heat would only be the ambient air and radiation from surrounding surfaces.

The human body for its part also expels radiative heat to the environment. Radiative heat is exchanged from the skin to the outer surface and then through the clothing insulation. This is quantified by ASHRAE (1997) as part of sensible heat loss from the skin and is given as R in the following equation:

$$R = f_{cl}h_r(t_{cl}-t_r), \qquad (1)$$

where: f_{cl} is the clothing area factor (percentage of clothed body area over the total area of the body in the nude)

h_r is the linear radiative heat transfer coefficient

t_{cl} is the mean temperature of the outer surface of the clothed body

t_r is the mean radiant air temperature

Convection is the mode of energy transfer between a solid surface and the adjacent liquid or gas that is in motion and it involves the combined effects of conduction and fluid motion. In a typical thermal environment, convection happens when heat is transferred or dissipated from the skin by means of wind and through respiration. ASHRAE (1997) considers this form of heat transfer from the skin to the environment together with conduction and radiation as part of the total sensible heat loss from the skin. It is given as follows:

$$C=f_{cl}h_c(t_{cl}-t_a) \qquad (2)$$

where: h_c is convective heat transfer coefficient

t_a is the operative temperature or the average of mean radiant and ambient temperatures weighted by their respective heat transfer coefficients

In convective heat loss during respiration, air is inhaled at ambient temperature conditions and exhaled at a saturated temperature that is near the body temperature. For this reason, ASHRAE (1997) describes convective heat loss due to respiration as more significant in amount compared to its occurrence in the skin.

Evaporation is similar to heat transfer by convection but also requires an initial change of state from liquid to vapour at the skin surface and subsequent diffusion of vapour across the boundary layer into the ambient air. (Parsons, 2003) Evaporation plays a key role in providing thermal comfort in the skin by the cooling effect of evaporating sweat. Evaporative heat loss from the skin depends on the difference between the water vapour pressure at the skin and in the ambient environment, and the amount of moisture on the skin. (ASHRAE, 1997) Heat loss due to evaporation can also be seen in the respiration process. The body exhales more saturated air compared to the ambient air that was inhaled. At a high humidity level, it can be observed that there is a discomfort in breathing since the body is having difficulty expelling moist air from the body to the environment.

2.1.3 Human Process and Responses to Achieve Thermal Comfort

The underlying concept for understanding human thermal comfort is that the body is in a constant exchange of heat with the thermal environment. In this exchange, the body goes through physiological processes subconsciously and makes conscious behavioural responses to achieve or maintain thermal comfort. In terms of physiology, heat is mainly produced in the cells of the body. (Parsons, 2003) This is transferred to the skin through convection by means of blood flow from the cells to the skin surface. As blood flows through the entire body, it passes through the brain which contains the hypothalamus. The hypothalamus is the central control of body temperature and has hot and cold temperature sensors to make sure that the body maintains its core temperature. (ASHRAE, 1997) Humans are hemeotherms who naturally maintain an internal core body temperature at 37•C. (Parsons, 2003) When the hypothalamus senses higher core temperatures, it commands the body to circulate more blood to the outer layer of the body and release heat through vasodilation. The blood vessels near the skin are expanded to allow more blood circulation and expel more convective and evaporative heat through the skin pores. If this measure is not enough, it enables the skin's eccrine glands to secrete sweat to aid evaporative cooling. Conversely, when the hypothalamus senses lower core temperatures, the blood vessels are made narrower to retain more body heat and prevent it from radiating out from the skin surface. Piloerection, a condition illustrated by the hairs standing on end, is caused by tiny skin muscles constricting. It also occurs when the skin is cold and is an attempt to reduce heat loss by maintaining a layer of still air between the body and the environment. (Parsons, 2003) At even lower temperatures, the muscles are activated by shivering to produce internal body heat in order to maintain the required core temperature.

Thermal comfort also includes behavioural actions by the conscious mind to reduce discomfort such as altering clothing, activities, orientation towards a heat source or even leaving the space. (Parsons, 2003) Change in clothing fashion depends on seasonal variations and can be observed in the different sets of clothes in different climatic zones. Changes in posture can also be considered as evidenced in the folding of arms near the chest to maintain body heat.

Nikolopoulou and Steemers (2003) describes these behavioural changes as part of physical adaptation which she describes as involving all the changes a person makes, in order to adjust oneself to the environment, or alter the environment to his / her needs. She identifies two kinds of physical adaptation: reactive and interactive. Reactive adaptation considers only the personal changes that a person makes like altering one’s clothing levels, posture and position or, even metabolic heat with the consumption of hot or cool drinks. Interactive adaptation, on the other hand, includes the changes that people make to the environment to improve their comfort conditions, such as opening a window, adjusting a thermostat, or opening a parasol. (Nikolopoulou et al, 2003)

Apart from behavioural responses, the mind also undergoes psychological responses. However, Parsons (2003) notes little knowledge in the field of psychological responses. He recommends a further avenue of research to correlate between the environmental phenomena, physiological responses and psychological phenomenon be studied.

2.1.4 Physical Factors Affecting Thermal Comfort

Air temperature, radiant temperature, humidity and air movement are the four physical environmental variables that affect human response to thermal environments. Aside from this, clothing and activity are also considered important personal components of thermal comfort (Parsons, 2003) which will be discussed in the next section. The human body senses these factors in a holistic manner because it does not have individual sensors to detect each factor (Toudert, 2005).

- *Air Temperature*

Temperature is defined as the average kinetic energy (heat) in a body. From the zeroth law of thermodynamics, which defines thermal equilibrium, higher temperatures always flow towards lower temperature to achieve thermal equilibrium (Cengel, 2007). This also applies to the heat exchanges with the human body and the environment where the human body is commonly surrounded by clothing and then by air.

Air temperature is defined as the temperature of the air surrounding the human body which is representative of that aspect of the surroundings that determines heat flow between human body and the air. (Parsons, 2003) In the study of thermal comfort, this is directly measured as dry bulb temperature usually using a mercury-in-glass thermometer, a thermocouple, a platinum resistance thermometer or a thermistor and is given as degrees Celsius (ºC) or degrees Fahrenheit (ºF).

- *Radiant Temperature*

Radiant temperature is measured from the radiant heat from any surface that can directly view any part of the body and thus exchange radiation (McQuiston et al, 2005) It is the temperature of an exposed surface in the environment. (ASHRAE, 1997) At any given situation, each body will emit radiant heat to each other and affect each other. Two values are considered for measuring radiant temperature: mean radiant temperature and plane radiant temperature. Both of which can be calculated.

As radiant heat comes from different directions, a mean value is used to represent uniformly the resultant radiant heat around the body. Thus the mean radiant temperature is the overall average value of radiant heat between the environment and the human body. This value is commonly considered to measure radiant heat for thermal comfort studies. McIntyre (1980) defines this as the temperature of a black-body source that would give the same value of some measured quantity of the radiation field as exists in reality'. It is the temperature in a uniform enclosure with which a small black sphere at test point would have the same radiation exchange as it does in the real environment. (Parsons, 2003)

Plane radiant temperature, on the other hand, provides information on the direction of radiant heat exchange and represents radiant heat from a single plane. This is important when large radiant sources are present in the environment at a specific orientation to the body like electric fire, steel furnace or a very cold wall. This value when measured from six sides, like that of a cube, can also be used to derive mean radiant temperature.

- *Relative Humidity*

Relative humidity is the measure of the air's ability to absorb moisture or water vapour. (Çengel, 2003) It can be derived as a proportion of the actual amount of water vapour in the air and the maximum amount of water vapour that the air can hold at that air temperature. (Health & Safety Executive, 2009) At higher temperatures, the air can hold more water vapour thus, decreasing the opportunity for the body to expel heat through evaporation from the skin. On the other side of the spectrum, lower humidity levels allow the skin to release heat at a faster rate making it easier for the body to achieve thermal comfort.

Nevins, Gonzalez, and Gagge (1975) recommend a relative humidity less than 60% to prevent discomfort on the warm side of the comfort zone. The standard desirable level of relative humidity ranges from 30 to 70 percent. This is based on studies from controlled indoor conditions. It should be noted that the upper relative humidity limits of ASHRAE Standard 55 were developed theoretically from limited data. In terms of ranges for outdoor thermal comfort, later studies by Nikolopoulou, Lykoudis (2006), and Ahmed (1997) observed these levels to be higher.

- *Wind speed*

Wind speed affects the rate at which warm air or vapour is taken away from the body thus affecting body temperature. (Parsons, 2003) In conditions with high relative humidity, wind helps achieve thermal comfort and even pleasure by means in evaporative cooling. A moderate breeze removes the amount of moist air that stays around the body which can then be replaced by fresher air. However, at higher wind speeds, excessive air motion results in unfavourable cooling of certain parts of the body that leads to discomfort.

Wind can come from different directions at different speeds at any given time. For convenience in measurements and since the variances are negligible, mean wind speed is usually considered in thermal comfort studies. To achieve this, the average value of instantaneous wind velocity readings for the desired observation period is obtained by getting the square root of the sum of squares for each direction. (Parsons, 2003)

2.1.5 Personal Factors Affecting Thermal Comfort

The personal factors that affect thermal comfort are clothing and activity. Clothing in thermal comfort studies is viewed as a form of insulation covering the body and is measured in clo units. Insulation by clothing depends on the capacity of the clothing material to resist heat from the external environment to reach the skin (in hot conditions) and the ability to retain convective and evaporative heat between the skin and the clothing's inner surface as it escapes the skin (in cold conditions). The surface area of the skin covered by clothing is also an important consideration as this affects the overall amount of body heat that is exchanged with the environment.

The importance of clothing to thermal comfort can be illustrated by the differences in sets of clothing in different climates as well as seasonal variations. People from temperate climates tend to wear more layers of clothing on different parts of the body like inner shirts, thermal jackets, jackets, scarves and boots. The materials used are commonly thicker and serve as thermal barriers. On warmer climates, clothing is typically thinner, more loose and sometimes lesser in covered skin area. The type of fabric is usually cotton which helps cover the skin from radiant temperature while absorbing moisture from the skin. The looseness of fabric also allows for the skin to release more skin moisture. This can be also be observed in seasonal and daily weather variations where people tend to add or remove layers of clothing depending on the external environmental conditions.

In previous studies, this factor has been considered to be the equalizing factor for the universality of thermal comfort findings. Fanger (1982) assumed universality in his findings based on the premise that the clothing coefficient used corresponds on the local habits of subject – in other words, people appropriately according to the weather.

Intrinsic clothing insulation (I_{cl}) is a property of the clothing itself and represents the resistance to heat transfer between the skin and the clothing surface

(Parsons, 2003) This depends on the surface area covered, difference in temperature between the skin and clothing surface and the thermal conductivity of the clothing. A simpler value to grasp was presented by Gagge, Burton and Bazett (1941) in the form of the Clo unit. A single Clo unit is a representation of the insulation needed to maintain comfort at 21°C for a person in a sedentary state and assumes that all the clothing in a given ensemble is uniformly distributed over the entire body surface. One clo depicts the total insulation effect of a typical business suit. Intrinsic clothing insulation (I_{cl}) represents the total insulating effect of an ensemble of clothes. Typical clothing ensembles are presented in Table 2.1.

Table 2.1: Typical Insulation Values for Clothing Ensembles

Ensemble Description	**I_{cl} (clo)**
Walking shorts, short-sleeve shirt	0.36
Trousers, short-sleeve shirt	0.57
Trousers, long-sleeve shirt	0.61
Same as above, plus suit jacket	0.96
Same as above, plus vest and T-shirt	1.14
Trousers, long sleeve shirt, long sleeve sweater, T-shirt	1.01
Same as above, plus suit jacket and long underwear bottoms	1.30
Sweat pants, sweat shirt	0.74
Long-sleeve pajama top, long pajama trousers, short ¾ sleeve robe, slippers (no socks)	0.96
Knee-length skirt, short-sleeve shirt, panty hose, sandals	0.54
Knee-length skirt, long sleeve shirt, full slip, panty hose	0.67
knee-length skirt, long sleeve shirt, half slip, panty hose, long sleeve sweater	1.10
Same as above, replace sweater with suit jacket	1.04
Ankle length skirt, long-sleeve shirt, suit jacket, panty hose	1.10
Long sleeve coveralls, T-shirt	0.72
Overalls, long sleeve shirt, T-shirt	0.89
Insulated coveralls, long sleeve thermal underwear, long underwear bottoms	1.37

* *All ensembles include shoes and briefs or panties. All ensembles except those with pantyhose include socks unless otherwise noted.*

Source: McCullough and Jones (1984 cited in ASHRAE, 1997), McCullough, Jones and Tamura. (1989 cited in ASHRAE, 1997)

The I_{cl} values given above are representative of typical combinations of clothing which might not be suitable to the actual observed clothing ensemble. In this case, the sum of effective insulation for each garment (I_{clu}) is obtained to represent the total clothing insulation value I_{cl}. Typical I_{clu} is given in Table 2.2.

Table 2.2: Individual Clothing Garments

Garment Description	Thermal Insulation Clo (I_{clu})	Garment Description	Thermal Insulation Clo (I_{clu})
Underwear		Jackets	
Panties	0.03	Light summer jacket	0.25
Underpants with long legs	0.10	Jacket	0.35
Singlet	0.04	Smock	0.30
T-shirt	0.09	High Insulative, fibre-pelt	
Shirt with long sleeves	0.12	Boiler suit	0.90
Panties and bra	0.03	Trousers	0.35
Shirts/blouses		Jacket	0.40
Short sleeves	0.15	Vest	0.20
Lightweight, long sleeves	0.20	Outdoor clothing	
Normal, long sleeves	0.25	Coat	0.60
Flannel shirt, long sleeves	0.30	Down jacket	0.55
Lightweight blouse, long sleeves	0.15	Parka	0.70
Trousers		Fibre-pelt overalls	0.55
Shorts	0.06	Sundries	
Lightweight	0.20	Socks	0.02
Normal	0.25	Thick ankle socks	0.05
Flannel	0.28	Thick long socks	0.10
Dresses/skirts		Nylon stockings	0.03
Light skirt (summer)	0.15	Shoes (thin soled)	0.02
Heavy dress (winter)	0.25	Shoes (thick soled)	0.04
Light dress, short sleeves	0.20	Boots	0.10
Winter dress, long sleeves	0.40	Gloves	0.05
Boiler suit	0.55		
Sweaters			
Sleeveless vest	0.12		
Thin sweater	0.20		
Sweater	0.28		
Thick sweater	0.35		

Source: Parsons (2003)

Activity affects thermal comfort due to the increase or decrease of metabolic heat that occurs for every action the body does. Activity is quantified by the metabolism rate of the human person per unit area and is represented in units by met. 1 met is defined as the metabolic rate of a typical sedentary person with a typical skin surface area of 1.8 m^2. This is equal to 58.2 W/m^2 or 50 kcal/(hm^2). A normal, healthy man has a maximum capacity of approximately 12 met at age 20 and 7 met at the age of 70. (ASHRAE, 1997) Different metabolic rates are listed in Table 2.3.

Table 2.3: Typical Metabolic Heat Generation for Various Activities

	W/m^2	**met[a]**
Resting		
Sleeping	40	0.7
Reclining	45	0.8
Seated, quiet	60	1.0
Standing, relaxed	70	1.2
Walking (on level surface)		
3.2 km/h (0.9m/s)	115	2.0
4.3 km/h (1.2 m/s)	150	2.6
6.4 km/h (1.8 m/s)	220	3.8
Office Activities		
Reading, seated	55	0.9
Writing	60	1.0
Typing	65	1.1
Filing, seated	70	1.2
Filing, standing	80	1.4
Walking about	100	1.7
Lifting packing	120	2.1
Driving/Flying		
Car	60-115	1.0-2.0
Aircraft, routine	70	1.2
Aircraft, instrument landing	105	1.8
Aircraft, combat	140	2.4
Heavy vehicle	185	3.2
Miscellaneous Occupational Activities		
Cooking	95-115	1.6-2.0
Housecleaning	115-200	2.0-3.4
Seated, heavy limb movement	130	2.2
Machine work		
sawing	105	1.8
light (electrical industry)	115-140	2.0-2.4
heavy	235	4.0
Handling 50-kg bags	235	4.0
Pick and shovel work	235-280	4.0-4.8
Miscellaneous Leisure Activities		
Dancing, social	140-255	2.-4.4
Calisthenics/exercise	175-235	3.0-4.0
Tennis, singles	210-270	3.6-4.0
Basketball	290-440	5.0-7.6
Wrestling, competitive	410-505	7.0-7.8

Source: ASHRAE (1997)

2.1.6 The Heat Balance Equation

Developed by Fanger (1982), the heat balance equation views that at a given point in time, the heat content of the body should be in equilibrium with the environment while maintaining a core body temperature of 37ºC. This means that the in order to maintain this equilibrium, the body would either absorb or transmit heat based on the thermal gradients that exists. It comes in an equation in units of Watts which considers the heat that generated within, transferred to and expelled from the body. The total amount of heat that is generated by metabolism and the heat transferred into the body should be equal to the heat coming out of the body. Thus it can be described conceptually as:

Heat generated within the body + Heat transferred into the body = Heat output (3)

For the body to be in thermal balance, the difference between heat production and output should be zero. Otherwise, the excess or deficiency would be quantified as stored heat and this causes an increase or decrease in body temperature. Heat generation is determined by body metabolism (M) and the amount of work (W) done at a given time. Heat is transferred to the body by conduction (K), convection (C), radiation (R), and evaporation (E). Heat stored or deficient is denoted by (S). Targeting for S = 0 to achieve heat balance, these values can summarized in the following equation:

$$S = M - W - (K + C + R + E) \qquad (4)$$

where: M – W is the resultant heat generated by the body

K + C + R + E accounts for all the heat transferred to the body

ASHRAE (1997) describes this equation further by appropriating the particular forms heat transfer in specific parts of the body. (1) sensible heat flows from the skin to the environment which is a combination of convection and radiation (C + R); (2) latent heat flow occurs with the evaporation of sweat and diffused moisture through the skin; (3) sensible heat flow during respiration; and (4) latent heat flow due to the evaporation of moisture during respiration.

Radiative and convective heat flows through the skin are affected by the insulating capacity of clothing. Thus the equation is given as follows:

$$M - W = Q_{sk} + Q_{res} + S$$
$$= (C + R + E_{sk}) + (C_{res} + E_{res}) + S_{sk} + Sc \qquad (5)$$

where: M = rate of metabolic heat production, W/m^2

W = rate of mechanical work accomplished, W/m^2

Q_{sk} = total rate of heat loss from skin, W/m^2

Q_{res} = total rate of heat loss through respiration, W/m^2

C + R = sensible heat loss from skin, W/m^2

E_{sk} = rate of total evaporative heat loss from skin, W/m^2

C_{res} = rate of convective heat loss from respiration, W/m^2

E_{res} = rate of evaporative heat loss from respiration, W/m^2

S_{sk} = rate of heat storage in skin compartment, W/m^2

S_c = rate of heat storage in core compartment, W/m^2

2.1.7 Thermal Comfort Models

Thermal comfort models relate the different parameters of comfort to a usable framework that can be used to predict or determine the possible comfort output of a given environment. Most of the established models are empirical in nature and consider heat exchange and comfort as static. Parsons (2003) identified two types of models: rational and empirical. Rational models are based on theoretical concepts which apply to the first three models presented in this section. An empirical model is based on measurement of subjects or on simplified relationships. The last model presented falls into this category.

- *Predicted Mean Vote (PMV)*

Fanger (1970) developed the “Predicted Mean Vote” (PMV) Index to predict thermal sensation based on four physical parameters and two personal parameters. It is defined as the ‘heat load that would be required to restore a state of comfort.’(Emmanuel, 2005) This model has been adapted by the International

Standards Organization and is measured on a seven-point scale known as the ASHRAE Scale which is given as follows:

-3 = cold
-2 = cool
-1 = slightly cool
0 = neutral / comfortable
+1 = slightly warm
+2 = warm
+3 = hot

Mainly based on sweat secretion and mean skin temperature, it assumes that there should be no observed sweating when comfort levels are achieved. It is predicted that 80% of people will vote within the range of ±1 if neutral temperatures are provided. The PMV Index can be found in Appendix A.

However, as further studies have been conducted, PMV has proved to be problematic because results of the PMV index are different to the user surveys on thermal comfort. PMV assumes that constant conditions are likely to be more comfortable than variable conditions (Nikolopoulou et al, 2006). More over, PMV applies only to indoor conditions and has been found to be far from realistic when compared to actual comfort surveys. Emmanuel (2005) also emphasized that the PMV model falls short in considering the vapour permeability of clothing. He also noted that the PMV model underestimates the possibility that people can be comfortable in a hot-humid environment despite having a certain amount of sweat and presented a limited range of conditions when applied to tropical climates as shown in Table 2.4.

Table 2.4: Limitations to the range of conditions over which PMV is applicable

Variable	Units	Lower limit	Upper limit
Metabolic rate	W/m^2 (met)	46 (0.8)	232 (4.0)
Clothing insulation	ºC/W (clo)	0 (0)	0.31 (2.0)
Air temperature	ºC	10	30
Radiant temperature	ºC	10	40
Air velocity	m/s	0	1
Vapor pressure	Pa		
Predicted Mean Vote	PMV	-2	2

Source: Emmanuel (2003)

- *Wet Bulb Globe Temperature (WBGT)*

Developed by Yaglou and Minard (1957; cited by Parsons, 2003) in US Navy investigations, the wet bulb globe temperature is an index based on heat stresses occurring between the body and the environment. It is a commonly used index due to its simplicity and coverage of extreme range of temperatures. The index considers the physiological effects of direct radiation and air movement. (Emmanuel, 2005) It comes in two equations which can be applicable to outdoor and indoor environments respectively as follows:

$WBGT = 0.7t_{nwb} + 0.2t_g + 0.1t_a$, for conditions with solar radiation (6)

$WBGT = 0.7t_{nwb} + 0.3t_a$, for indoor conditions with no solar radiation (7)

where: t_{nwb} = temperature of naturally ventilated wet bulb thermometer

t_g = temperature of a 150mm diameter black globe thermometer

t_a = air temperature

The computed WBGT can then be compared to the activity level from the following table given by ISO 7243 which defines limits for acclimatized and non-acclimatized persons.

Table 2.5: WBGT Reference Values

Metabolic rate - M (watts)	**WBGT values (deg. C)**	
	Acclimatized	**Non-acclimatized**
Seated (66 < M < 130)	30	29
Light walking (131 < M < 200)	28	26
Brisk walking (201 < M < 260)	25 (26)	22 (23)
Heavy work (M>261)	23 (35)	18 (20)

Source: Parsons (2003)

Even for its recognized application for outdoor studies, it is important to note that the WBGT is a form of heat stress index which is the opposite of thermal comfort. Because of its nature, it can be used to define allowable limits for a person to continue his activity but not necessarily in a comfortable state. Parsons (2003) noted that it has limitations when used to simulate human response and ‘should be used with caution in practical applications.’ In addition, Emmanuel (2005) noted that data requirements are ‘highly idiosyncratic’ and not readily available pointing out that globe temperature has to be custom-measured, aside from emphasizing that it is clearly not a comfort index.

- *Physiological Equivalent Temperature (PET)*

The physiological equivalent temperature (PET) is defined by Hoppe (1999) as 'the air temperature at which, in a typical indoor setting (without wind and solar radiation), the heat budget of a human body is balanced with the same core and skin temperature under the complex outdoor conditions assessed.' This universal index was based on the Munich Energy-balance Model for Individuals (MEMI) which views the human body in thermal balance in a more physiological light. The model is intended for lay persons to more easily evaluate the outdoor conditions in relation to what is being experienced indoors. To visualize, Hoppe presented an example where, on hot summer days, the PET value may be more than 20K higher than the air temperature. From the point of view of a studies in tropical climates however, Emmanuel (2005) points out that the weakness of this model lies in its limits of applicability where air velocity should be more than 0.1 m/s and vapor pressure to be more than 12 hPa.

- *The Adaptive Model*

The adaptive comfort model by Nicol (1993) recognizes the psychological / behavioural aspect of people's perception of comfort over the purely physiological conditions of the body. In this model, Nicol observes that man achieves thermal comfort by taking a range of actions. The degree of comfort or discomfort is then based on how easily he can achieve this in an order starting from the physiological adjustments inside the body followed by personal changes in activity and clothing, then by modifying the thermal environment, then possibly by selecting a different environment. The model implies that, 'given sufficient time, people will find ways in which to adapt to any change of temperature so long as it does not pose a threat of heat stroke or hypothermia.' Reasons for the occurrence of discomfort were then identified as follows:

(1) when temperatures change too fast for adaptation to take place;

(2) when temperatures are outside normally acceptable limits;
(3) when changes are unexpected;
(4) when conditions in the environment are outside of individual control.

2.2 Studies that have addressed similar problems

Parsons (2003) relates that research on outdoor thermal comfort started in the 1930's in relation to the extreme effects of temperature on public health. It is only in the past couple of decades that interest in urban thermal comfort has been growing in pursuit of sustainable development. However, relatively little research has been done on outdoor thermal comfort as compared to indoors.

One of the earlier studies of outdoor comfort in the urban context was that of Ahmed (1997) where he defined the boundaries of outdoor thermal comfort in Dhaka, Bangladesh. The local climate of the city is tropical hot-humid. Ahmed recognized the need for comfortable outdoors based on the observation that people generally want to stay in a more satisfying controlled indoor environment to keep away from discomfort outside. This pattern of occupant usage between indoor and outdoor environments can lead to an increased demand for energy inside the buildings. The research was then aimed to determine the environmental situations that would be comfortable for people in the outdoors in Dhaka and from this, recommendations were presented on how this could be achieved. The methodology of the study involved field surveys on random subjects and measurements of the physical environmental conditions namely temperature, wind speed, humidity and light levels. Personal variables such as age, sex, clothing, temporality and location were considered. Subjective responses from around 1500 subjects in different locations around the city were studied during the summer months.

Based on the findings, the author noted that people are more sensitive to globe temperature over air temperature and thus recommended shading as a top priority. It was also found that people's response to thermal comfort varies depending on their length of stay outside. People who tend to stay indoors most of the time, office workers for example, more often reported warm discomfort than those who spend more of their time outdoors like street traders for example. This meant that the range of comfortable temperatures were higher for the ‘outdoor types’. The author also emphasized that prescriptions for thermal comfort are better presented in ranges than in fixed values of temperature, for example, usually done in the design for indoor thermal comfort. The boundaries for outdoor thermal comfort in radiant temperature was defined in the study to be 28.5 ºC to 32°C for people wearing typical summer clothing doing sedentary activities in still air conditions and a relative humidity of 70%. Ahmed also noted that the comfortable humidity range extends up to 95% if the wind speed is more than 2 m/s. Temperature swings for people staying outdoors at a longer period can be up to ±3 while ±1 is recommended for those staying for a short time.

Ahmed recommended future researchers to investigate the relation or ‘continuum’ of comfort perception between indoors and outdoors as well as the relation of the environment and people’s behavior in urban spaces. He also recommended the development of a dynamic comfort model which includes the environmental factors considered in the research.

Another earlier study was conducted by Aynsley and Spruill (1990) in an effort to generate thermal comfort models for outdoor thermal comfort in warm humid climates. They presented a history of thermal comfort studies for military workers, however, these were applicable to indoor settings. Different thermal comfort models were also compared against each other with respect to their usability for the public. They involved mostly mathematical and theoretical models.

Brager and De Dear (1998) conducted a literature review on thermal adaptation in the built environment. They noted that thermal adaptation is attributed to behavioral adjustments, physiological acclimatization and psychological habituation or expectation. The literature review covered studies of indoor air-conditioned conditions versus naturally-ventilated buildings. The findings of the literature review challenged assumptions / theories founded on established laboratory based comfort standards because of the lack of contextual influences particularly adaptation. It was also noted that behavioral adjustment and expectation plays a role and recommends these topics for future research and development in the area. Brager et al also recognized that adaptation changes with culture and location and therefore cannot be regarded as universal.

One of the most extensive studies conducted in the field of outdoor thermal comfort was that of Nikolopoulou et al (2006). The study falls under the Key Action 4: “City of Tomorrow and Cultural Heritage” of the European Union’s Fifth Framework Programme which strives to explore ways of achieving sustainable development across Europe. With the goal of revitalizing people’s quality of life in the urban setting, the study focused on understanding the dynamics of the parameters involved in the perception of comfort in Europe. Covering seven cities across Europe, the field surveys and weather monitoring were conducted during summer, autumn, winter and spring. The variables considered were the 6 basic parameters discussed earlier combined with acoustic and light levels.

One of the most significant findings was that the actual perception of comfort of people in the outdoors in the continent was found to be higher for higher temperatures compared to the established predictions by Fanger (1982) i.e. the Prime Mean Vote. This meant that people are more tolerant to higher ranges in outdoor environmental conditions when they are outdoors and the authors attribute this observation to adaptation. They noted that a purely physical approach to thermal comfort is insufficient when discussing outdoor thermal comfort since there are numerous uncontrolled variables involved. It was seen that psychology plays a major role in outdoor thermal comfort.

Another important finding was that there was a high inverse correlation between air temperature and clothing. As temperature increases, people tend to remove or minimize their clothing levels. Conversely, as temperature decreases, more layers of clothing are used. Also attributed to an increase in temperature is the preference for cold drinks and activities requiring lower metabolic rates. Similar to the findings of Ahmed, people are not as sensitive to humidity except for when the levels are considered to be in the higher ranges. It was also observed that people in Europe can adapt more easily to heat than cold as explained by the high response on the warm scale.

The findings of the study were further developed as a tool for designers as part of the handbook Designing Open Spaces in the Urban Environment: a Bioclimatic Approach published by the Centre for Renewable Energy Sources. The tool presents models for the prediction of thermal comfort conditions based on the actual sensation votes the authors collected. The models are in the form of a city comfort index prescribed for each of the seven cities. When using this index, the designer is required to input the four available meteorological parameters: air temperature, solar radiation, wind speed, and relative humidity to determine the Actual Sensation Vote (ASV). Once the ASV is determined, comfort nomograms for a city with similar climate can be used to approximate the percentage of people feeling comfortable. From this, designers can incorporate the required environmental conditions needed. The limits of the index and the nomograms are advised to be only within 5ºC to 35ºC. (Center for Renewable Energy Sources, 2004)

In spite of the extent of studies discussed, the author found a gap in the body of knowledge for outdoor thermal comfort in countries with the hotter and more humid climate characteristic such as those in the Middle Eastern region. The studies gave recommendations on outdoor thermal comfort for temperate and tropical climates. The climate in the Middle East extends above the applicable environmental conditions already considered. Typically, there could be an initial negative impression that outdoor thermal comfort can be achieved in these regions. However, it is worth exploring the dynamics of comfort in these higher ranges and in doing so whether comfortable urban outdoors in hotter more humid climates can be achieved where urban design is based on an established set of criterion considering the actual perception of the region's city dwellers.

More over, the study will be significant to urban designers and architects in the region enabling them to make the outdoor more comfortable for longer periods during the year. It is also deemed significant for the residents to be provided with a deeper understanding of the dynamics of thermal comfort that they experience when staying outdoors.

CHAPTER 3: METHODOLOGY

3.1 Design of Methodology

Before elaborating the methodology of the research, it is important to place the research design in the context of the science of research itself. As recommended by Creswell (2009), there are three main elements in determining the design of a piece of research: (1) philosophical worldview, (2) strategies of inquiry and (3) research methods.

A philosophical worldview is the basic set of beliefs that guide action. It is the general orientation about the world and the nature of the research that the researcher holds. There are three main worldview classifications: post-positivist, advocacy and participatory, and pragmatic.

A post-positivist worldview reflects the need to identify and assess the causes that influence outcomes. It is often used in quantitative research design and strictly follows the discipline of the scientific method. Advocacy and participatory worldview calls for reform or action agenda. It often considers the marginalized population and is used mainly for politics and research on political agendas where reforms can be introduced. The pragmatic worldview is concerned with applications on what works and solutions to problems. In this view, the researcher emphasizes the problem and uses all approaches available to understand it. This usually applies to mixed methods research and the main concern is to understand the problem itself. The hows and whats of research are looked upon in this type of worldview. Given the nature of the study, a post-positivist worldview was taken. In this case, physical components of the thermal environment as well as the human response were assessed to determine its effect on thermal comfort.

Strategies of inquiry have three main classifications: quantitative, qualitative and mixed method strategies. Quantitative strategies involve survey research (study of a sample population in the real world) and experimental research (examination of different combinations of variables in a controlled environment). Qualitative strategies include ethnography (study of cultural groups), grounded theory (abstraction of theory of a process, action or interaction based on grounded view of participants), case studies (an in-depth exploration of a program, event, activity or process within a sustained period of time), phenomenological (identification of the essence of human experience about a phenomenon) and narrative (study of lives of individuals, and asks other individuals about lives of the subject or individual). Mixed method strategies are mainly used in social research to study validity of psychological traits. It can be a combination of interviews and observations (collection of qualitative data) and traditional surveys (measurement of quantitative data). Convergence of the qualitative and quantitative data gathered is achieved through triangulation. Based on the literature discussed earlier, a quantitative strategy was employed in the form of field measurements and surveys.

Lastly, a research method had to be decided upon. This covers data collection, analysis and interpretation. Quantitative research methods usually use closed-ended questions, utilize predetermined methods, deal with numeric data and employ statistical analysis. Qualitative methods use open-ended questions and emerging methods as this type of research is exploratory in nature. Mixed methods use both open-ended and closed ended questions, employs both statistical and text analyses and multiple forms of data drawing on all possibilities. For this study, the quantitative method was used wherein closed-ended interview surveys alongside field measurements were seen as data gathering tools. Data gathered was then subjected to statistical analysis to generate discussions and conclusions.

3.1.1 Comparison of Different Methods

Several methodologies of research have been considered in carrying out the study. These are through experimentation, simulation, survey techniques and historical analysis. As discussed by Creswell (2009), experimentation requires four basic components namely: participants, materials, procedures and measures.

In this field of study the participants are the people from which perceptions on comfort based on the variables tested can be obtained from. Variables should also be clearly defined and categorized between independent and dependent. In this case, the independent variables shall be the 6 basic parameters of comfort and possibly secondary considerations such as age, sex, nationality and temporality. The main dependent variable is then the comfort perception.

In an experimental setup, the independent variables should be identified as one that can be controlled. In this manner, different settings with varying combinations of the independent variables can be compared in order to generate results and start discussions. This has been done the past decades with the goal of establishing workable thermal comfort indices. Major works cited by Parsons (2003) are shown in Table 3.1.

Table 3.1: Major studies using experimental methodology

	Comfort index developed	**Brief description of experiment**
Houghton and Yagloglou (1923, 1924), Yagloglou and Miller (1925)	Effective temperature	3 subjects were asked to walk between two chambers with different combinations of air temperature and humidity, then asked for their impressions of warmth
Dufton (1929, 1936)	Equivalent temperature	correlated subjective judgements on experimental environmental settings with a heated black copper cylinder simulating thermal behaviour of the human body
Nevins et al (1966)	Comfort conditions used in ASHRAE standards	groups of subjects were exposed in controlled climate chambers seated and in light clothing for three hours
Fanger (1970)	Predicted Mean Vote	measured sweat rate and skin temperature of subjects with different met rates in a climate chamber (CLEAR, 2009)

Derived from Parsons (2003).

Compared to laboratory experiments, simulation can be considered more convenient, cost-effective and possibly more ethical while minimizing possible human errors in setting up an experimental chamber. It follows the basic requirements needed for experiments with controlled independent variables as the 6 basic parameters and comfort votes as the dependent variables. Considering the relatively young development of research in this field, the body of knowledge on outdoor thermal comfort is still at the stage of understanding the dynamics between its parameters. Numerous models and indices have been developed and are still being compared against each other as evidenced in the work presented by Monteiro and Alucci (2006). Simulation studies require a solid well developed theoretical model or equation for it to run and give predictions. At this point, this type of method therefore is more applicable in studies where real applications are needed as against gaining understanding of the relationship between the studied variables.

However, it is important to note that there are existing simulation programs available such as Radtherm, Outdoor Comfort Expert System (OUTCOMES) by Heisler and Wang (2002), and Rayman 1.1 by Matzarakis (2009). Radtherm was developed by Thermoanalytics which is commonly used in simulating thermal comfort indoors and inside vehicles. OUTCOMES employs an energy balance index considering the 6 basic parameters as well as air quality, vegetation, reflectivity of the ground and nearby objects and sky view factor. Rayman 1.1 is free downloadable software which measures mean radiant temperatures needed for heat balance equations while considering shading from trees and buildings. Its simulation output provides three indices.

As the study of thermal comfort requires analysis of interaction of the body with the external environment, the subject matter would be difficult if not appropriate to conduct using historical research or literature review. Relevant studies incorporating a literature review methodology were found to be those conducted by Brager et al (1998); and Givoni, Noguchi, Saaroni, Pochter, Yaacov, Feller, and Becker (2003). Brager et al presented an extensive literature review about thermal adaptation focusing on air-conditioned against naturally ventilated conditions. At a time where definite standards still do not exist, the research gave a deeper look into the existing and seemingly unrelated thermal comfort modeling approaches: the heat balance approach and the adaptive model. The results of the study suggest that the two approaches are complementary. The authors also recognized the importance of thermal adaptation as affecting comfort in naturally ventilated buildings.

Givoni et al (2003), on the other hand, reviewed experimental thermal comfort studies conducted in Japan and in Israel where problems in conducting the research as well as analyzing the data were discussed. Both studies discussed employed the field survey and monitoring method.

Lastly, the field surveys as a methodology is most commonly used for thermal comfort studies. Roaf (2004) explains that designers need to specify conditions that people will find comfortable, in terms of temperature, humidity and air movement. They generally do this in two ways: (1) by scientific analysis of the heat exchanges between the body and the environment and (2) by using surveys of comfort in the field and relating this to the physical environment using statistical analysis. The first option applies to studies that use a theoretical model in the form of equations and are most conveniently carried out with using simulation software. This is assuming that there exists a solidly grounded thermal comfort model that is, if possible, regarded as universal.

The second option is perhaps the most suitable method of all because of its direct analysis of the main sources of data – human beings and their subjective responses. This method has been used by Ahmed (2003) and Nikolopoulou et al (2006) as well as the pioneering research performed earlier in the pursuit of establishing models and indices for comfort. From the survey and measurements, trends and relationships were established using graphs and statistical analysis. Aside from the strength of direct access to the subject, it is worth noting that the outdoor environment poses a rich combination of possible influences to the thermal comfort which is so far in comparison to the simpler context of indoor comfort studies. The simpler and most straightforward way to study the dynamics of thermal comfort in the outdoors would then be this combination of field measurements and interview surveys.

3.1.2 Selection of Method

As such, the study followed a combination of interview survey techniques and field measurements of the physical and personal variables considered which are air temperature, solar radiation, wind speeds, relative humidity, clothing and activity levels. The interview survey employed random selection of subjects in different sites where each subject is given an equal opportunity of being selected and would not have the chance to be influenced in terms of comfort perception given a short notice for the interview. The basic principle of the methodology was then to measure the environmental parameters and compare these to the subjective thermal comfort perceptions of the people in order to obtain the ranges of variables that would be considered comfortable. Aside this, relationships between the subjective votes and the variables can be generated as well as hierarchy of importance among the variables can also be defined as it applies to climate being considered. From this understanding, the relationships established can be translated into recommendations which can be used for the design of comfortable urban outdoors in the Middle Eastern region.

3.2 Independent and Dependent Variables

As discussed in Chapter 2, thermal comfort is affected by both physical and personal components. The physical factors are air temperature, radiant temperature, relative humidity and wind speed. For this study, both physical and personal factors were set as independent variables. Air temperature was measured as dry bulb temperature in degrees Celsius. Given the availability of measuring tools, the radiant temperature was represented as a variable using the measured radiation levels (mWh/cm) from the meteorological station at Dubai Airport. Relative humidity was considered to be in % values as given by the measuring instruments while wind speed was measured regardless of its direction.

The personal factors are clothing and activity. For this study, clo values for the ensemble of each respondent can be computed using the database presented earlier. Approximations can be made for garments which are not directly represented in the database. Activity was quantified as met and was basically classified into 4 types: sitting, standing, walking and running.

The main dependent variable is overall thermal comfort represented in the questionnaire as ‘Are you comfortable?’ This was answered as either yes or no. This variable bears weight based on the combined effect of the six independent variables described in Chapter 2. Secondary dependent variables are the heat votes, sun votes, humidity votes and wind votes. These responses were seen as an isolated effect of each independent variable for each subject and would be useful in understanding the dynamics of comfort perception in this given climate.

3.3 Population Sample and Participants

The study used random sampling of pedestrians and commuters in the selected survey sites during the given time periods. Given the limited manpower, the researcher’s target was to gather 20 responses for each 2-hour survey period. People walking, passing through, standing or sitting outside of an enclosed space were considered subjects. The surveyor did not need to decide on a candidate participant’s age, sex, and impression of nationality but noted this as part of the observation in each interview. However, if there was an abundance of potential participants at a given time, priority was given to represent a wide range of age, sex and nationalities present in the area.

3.4 Data Collection Instruments

This section provides information on the data collection techniques and instruments used in the study. The main techniques were field measurements of environmental conditions and interview surveys. Description of the survey sites, timeframes considered and the statistical analysis methods are also given.

3.4.1. Field Measurements

Field measurements were conducted to determine the actual conditions of the thermal environment at the time of the interview. These are taken immediately after each interview. The parameters measured are air temperature, relative humidity, ground temperature and wind speed.

Dry bulb temperature and relative humidity were measured using a digital probe hygro-thermometer by Extech Instruments Model RH101. The unit of measure for air temperature was in Degrees Celsius (°C) while relative humidity was in %. The probe was mounted to the surveyor's questionnaire clipboard while conducting the survey. The height of this is approximately 1.2 meters above ground. If the researcher comes from indoors before the interview, the hygro-thermometer had to be switched on atleast 10 minutes before starting an interview to ensure that the probe is reading the actual conditions outdoors and not that in the previous indoor setting. Radiant temperatures were represented as sun radiation levels measured from the nearest meteorological station in the Dubai Airport.

Wind speed was measured using a handy anemometer by Extech Instruments Model 45158. The unit of measure for wind speed is meters per second (m/s) and at a height of approximately 1.8 meters above ground facing the direction of the wind source. Since wind speed varies at different instances, the researcher considered the highest wind speed reading within 1 minute of measurement.

3.4.2 Interview Survey

The interview was divided into two main parts: questionnaires and observations. In doing this, each interview was shortened thereby avoiding questionnaire fatigue from the participant's side and allowing the researcher to gather more respondents within the given timeframe. All of the responses were logged by the researcher in a survey sheet. Figure 3.1 presents a completed sample of a survey sheet. At every hour of each survey session, the surveyor filled out the Overall Observation Sheet then proceeded with the individual interview surveys.

1. Introduce yourself & show your ID

   "I am Malaya from BUiD doing my masters thesis for Sustainable Design. My research is about thermal comfort of pedestrians in Dubai. Can you participate in my survey? It will take only 2 minutes to answer the simple questions.
2. Ask the questions while jotting down answers.
3. Get temperature readings
4. Fill out the observation sheet.

Questions 2-6 gathered the participant's subjective response to air temperature (heat vote), radiant temperature / solar radiation (sun vote), wind (wind vote), humidity (humidity vote) and their overall perception of whether they are comfortable outside at that particular moment (comfort vote). The items highlighted in red on Figure 3.1 were adapted from the available survey form used by Nikoloupoulou et al (2006) which was accessed from the RUROS Website (2009) because of its comprehensiveness and ease of understanding for a candidate interviewee. After the first survey season, the author found it difficult to summarize the results in a coded manner, thus the codes for each possible answer were integrated in the survey questionnaires.

ID NO.: 011
Time: 4:42

Date: 18 Nov. 2008

Site: SZR
Season: Autumn

T air (deg. C): 23.2
RH (%): 58.7
T ground (deg. C): 24
Wind Speed (m/s): .7

	Age group	1= child	2= teenager	3= 18-24	4= 25-34	5= 35-44
		6= 45-54	7= 55-64	8= 65 & up		
	At the moment, do you find it:	-2 very cold	-1 cold	0 neither cool nor warm	1 warm	2 very hot
	What do you think of the sun this moment?	-1 you'd prefer more		0 OK	1 too much sun	
	What do you think of the wind at this moment?	-2 stale	-1 little wind	0 OK	1 windy	2 too much wind
	What do you think of the humidity at this moment?	-1 damp	0 OK	1 dry		
	Are you feeling comfortable?	0 no	1 yes			
7	How long have you been outside?	1= 1-5 min.	2= 6-10 min.	3= 11-30 min.	4= 31-60 min.	5= more than 1 hour
8	For the last 30 min., have you been mainly		1 sitting	2 standing	3 walking	4 running
	Where were you before you came here?	1 at home	2 at work	3 store / shop / mall	4 restaurant	5 outdoors
		6 hotel	7 mosque	8 bank	9 vehicle	10 gym
		other				
	Why have you come here?	10 wait for transport	11 crossing thru	12 break	13 drink/eat	14 shopping
		15 meet friends	16 for a walk	17 for rest	18 for errand	19 to smoke
		20 other:				
11	1st time here?					
12	How many times do you come here in 1 day		1			
13	How many times do you come here in 1 week?		~~3~~ 5			
14	Do you come here on hotter times of summer? (June, July, August)?				0 no	1 yes
15	From which country do you come from?		India		City:	Kerala
16	How many years have you been living in UAE?		6y			
	Are you...?	10 pupil / student	20 working person	30 pensioner	40 house keeper	51 tourist
		other				
	What is your educational level?	1 primary	2 secondary school		3 higher education	
19	What amenities would you like to have to make your stay outside more comfortable?	make AC bus stop work!				

	1 sitting	2 standing	3 walking	4 running
	1 male	2 female		
	1 alone	2 with 1 person	3 w/ more than 1	4 with a dog
		0 no	1 yes	

Accessories		
shades	Cap/hat	tie
umbrella	Turban	shawl on head
fan	Katra	shawl on shoulder

Clothing					
Upper body	t-shirt	jumper	sweatshirt	[illegible]	
length	sleeveless	short sleeves	long sleeves		
fabric	cotton	synthetic	woolen	other	
color	light	dark			
Lower body	shorts	trousers	jeans	skirt	
length	short	long			
fabric	cotton	synthetic	woolen	other	
color	light	dark			
Dress	long	short	abaya	kandura	
Additional clothing	vest	cardigan	jacket	raincoat	suit

Figure 3.1: Completed Sample of Survey Questionnaire

3.4.3 Dubai, UAE Meteorological Data

The United Arab Emirates is part of the Middle Eastern region of Asia. The UAE is surrounded by the Arabian Gulf in the north, Saudi Arabia on the southwest, and Oman on the southeast. Dubai is one the seven emirates of the UAE and is the second largest city in the country next to its capital, Abu Dhabi. The climate of the UAE is generally described as arid sub-tropical, however, it experiences high levels of humidity throughout the year due to its adjacency to the Persian Gulf.

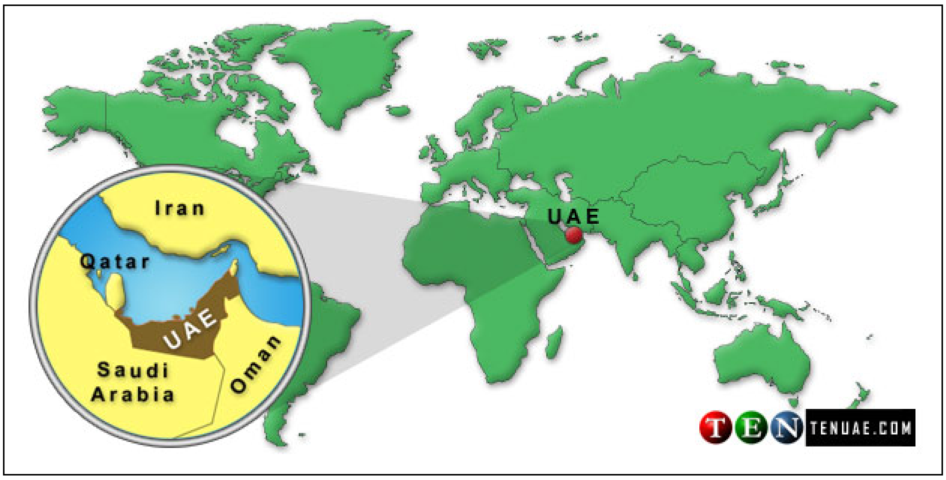

Figure 3.2: Location of the United Arab Emirates in the World. *Source: The Emirates Network [Online] (2009)*

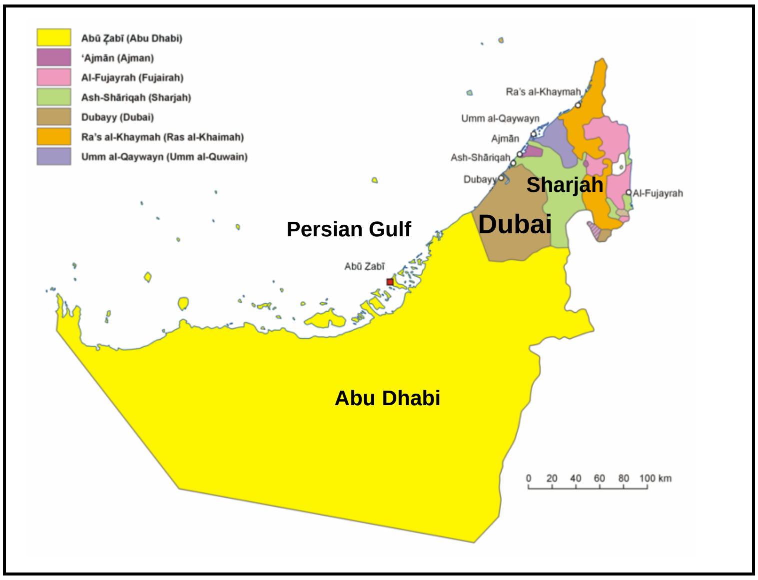

Figure 3.3: Location of the Dubai within the UAE. *Source: UAE Properties [Online] (2009)*

The summer season usually start on June until September with August being the hottest month with high levels of humidity. Temperature during this month can reach more than 50ºC but the average monthly temperature is around 41°C. The cooler months of winter which occurs from December to February can have average maximum temperatures between 23-26ºC but can drop to around 14ºC at night time. Mid-seasons, autumn and spring months cover October to November and March to April, respectively, where the average maximum temperature ranges between 30-37ºC.

The daily average temperatures in Dubai can range from a low 19.4°C in winter to 41.3°C high during summer. However, daily recorded temperatures in winter can even go as low as 10°C and can even go above 50°C at the peak of summer. It can be noted that, for the past few years, Dubai has experienced relatively shorter summers with higher temperature peaks and winters are getting even colder than the year before. Perhaps this could be attributed to the world-wide climate change phenomena as affected by earth's natural process and human activity. A summary of mean monthly climate conditions is given in Table 3.2.

Table 3.2: Mean Monthly Climate Conditions in Dubai, UAE

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Average Maximum Temperature °C	23.9	25.3	28.3	33.0	37.6	39.5	40.9	41.3	38.9	35.4	30.5	26.1
Average Minimum Temperature °C	14.3	15.4	17.6	20.9	25.0	27.2	29.9	30.3	27.6	24.0	20.0	16.3
Mean Rainfall (mm)	18.4	25.0	21.0	7.0	0.4	0.0	0.8	0.0	0.0	1.1	2.7	15.1
Mean No. of Days with Rain	5.5	4.8	5.7	2.6	0.3	0.0	0.5	0.5	0.1	0.2	1.3	3.7
Sunshine Hours / day	8.1	8.5	8.6	10.2	11.3	11.5	10.7	10.5	10.4	9.9	9.3	8.2
Mean Sea Temperature °C	20.9	20.6	22.3	25.0	28.6	31.2	32.2	32.9	31.9	29.7	27.1	23.3

Source: Dubai Meteorological Office, 2009.

Local north-westerly winds, locally referred to as *shamal*, frequently develop during the winter bringing cooler windy conditions. As can be seen from the Table 3.2, rainfall can be described as sparse and intermittent usually occurring during the winter months of February or March. Winter rains take the form of short sharp bursts, which, if occurring in the Hajar Mountains, run off rapidly into wadis and onto the down-washed gravel plains. Localised thunderstorms occasionally occur during the summer. (UAE Interact, 2009) A detailed description of monthly weather is provided in Appendix B.

Average relative humidity in Dubai, as shown in the Figure 3.4, range from 40% - 60 % year-round, however, daily readings can go as high as 80-90% maximum during summer.

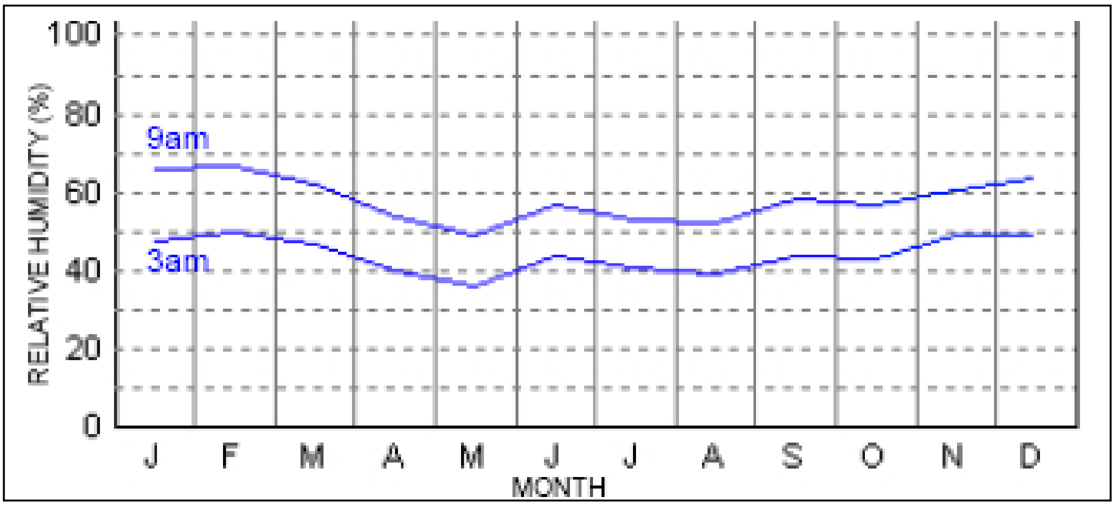

Figure 3.4: Mean Monthly Relative Humidity Levels. *Source: Ecotect (2009)*

Detailed hourly readings of air temperature, wind speeds, and relative humidity for the survey periods can be found in Appendix C. Daily readings of solar radiation are also located in the same appendix. The meteorological station is located in the Dubai International Airport in Deira.

3.4.4 Survey Sites

To capture a varied mix of nationalities and activities in the sample population, the target locations for the survey were pedestrian areas adjacent to major public transportation routes in commercial and residential areas. Different zone classifications were also considered in order to capture a significant amount of respondents between mornings and evenings, and weekdays and weekends. The areas considered were as follows:

a. **Commercial** - Pedestrian area along Sheikh Zayed road opposite Emirates Towers in front of Al Durrah Building

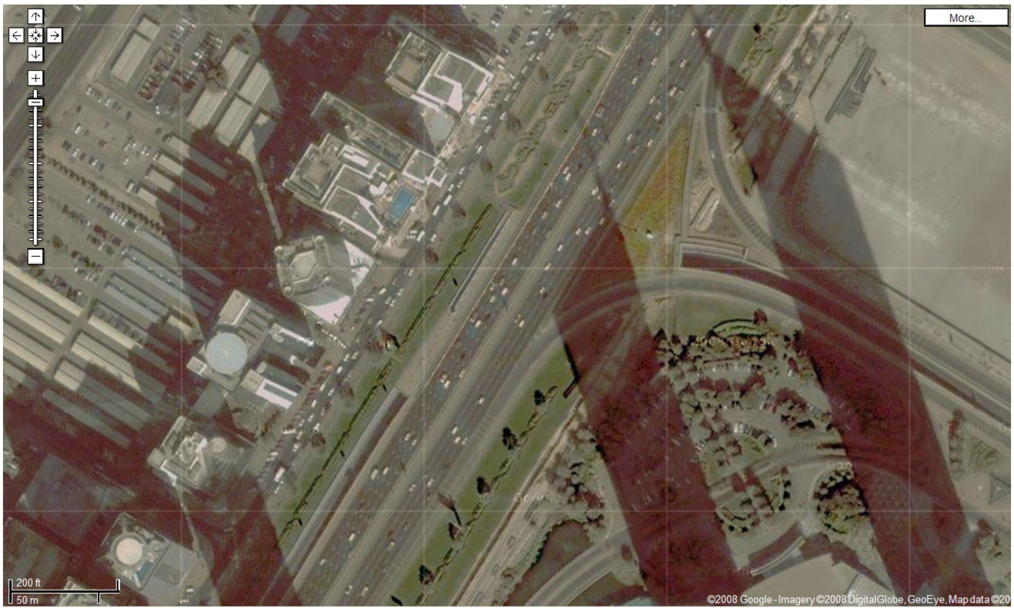

Figure 3.5: Survey Site 1 – Sheikh Zayed Road. *Source: Google Maps (2008)*

b. **Mixed-Use (Residential & Commercial)** – Pedestrian area in Deira along Abu Baker Al Siddique Road between Al Kabayl Supermarket and Old Ministry of Labour

Figure 3.6: Survey Site 2 – Abu Baker Al Siddique Road, Deira. *Source: Google Maps (2008)*

c. **Residential** – Pedestrian area along Mankhool Road in front of Al Hanah Center

Figure 3.7: Survey Site 3 – Al Mankhool Road. *Source: Google Maps (2008)*

3.4.5 Survey Time Frame

The seasons covered by the survey were summer (September), autumn (November) and winter (January). Each season had a total of 4 survey days – Tuesday, Wednesday, Thursday and Friday.

2. Covered seasons: Summer – September
   Autumn – November
   Winter - January

3. Covered days: 2 week days per season in a commercial area
   2 week days per season in a residential area

4. Survey time periods: There were 3 survey time periods per day to consider the effect of daily weather changes. Given the limited manpower available, each period was in duration of two hours. The timings were as follows: 7:00-9:00 am; 12:00pm – 2:00pm; and 5:00-7:00 pm.

3.5 Statistical Analysis

3.5.1 Statistical Software

As the study uses survey techniques over a sample population, the purpose is ‘to generalize from a sample to a population so that inferences can be made about some characteristic, attitude, or behaviour of this population. (Babbie, 1990 cited by Creswell, 2009) The study used two softwares for data analysis: Microsoft Excel and Statistical Package for the Social Sciences (SPSS). The Microsoft Excel program is a commonly available software used for computations and data tabulation among others. This was chosen because of the author’s familiarity and ease of use in generating tables and graphs to illustrate possible relationships and trends. The SPSS is a widely used software for statistical analysis in non-mathematical applications. It is capable of performing several statistical analyses in a comprehensive manner with a user interface allowing the user to keep track of organized data. This powerful tool has been used by Nikolopoulou et al (2006) in their previous comfort surveys.

Data collected from the field measurements and interview surveys were collated in a data set in Microsoft Excel. From the data set, statistical procedures were run in SPSS to generate different angles for analysis and discussion. Histograms of subjective votes against the 6 independent variables previously identified in Chapter 2 were generated using crosstabs and exported to Microsoft Excel to generate tables and graphs. Correlations as well as regression studies were also employed.

3.5.2 Analysis Matrix

Considering that the study involves several independent and dependent variables, the author devised an analysis matrix given below as a guide as to which combinations of variables are to be analyzed. The interpolation of relationships given below are conceptually based on the studies conducted by

Ahmed (2003) and Nikolopoulou (2006) as an initial guide as to how these several combinations will be dealt with in the analysis phase.

Table 3.3: Analysis Matrix

Independent Variables	Dependent Variables				
	Comfort Vote	**Heat Vote**	**Wind Vote**	**Humidity Vote**	**Sun Vote**
Air Temperature (measured)	a	a			
Wind Speed (measured)	a		a		
Relative Humidity (measure)	a			a	
Solar Radiation (meteorological)	a				a
Clothing levels (observed)	a				
Activity (observed)	a				

3.6 Challenges to the Researcher

Considering the extreme conditions during summer and winter, the researcher faced challenges while conducting the survey sessions. Because of prolonged outdoor stay during summer, the researcher developed severe skin rashes on the third day of survey and decided to reschedule the next survey session a week after with proper medication and precautionary measures. This explains why the last day of survey was conducted on October 1. During winter, the researcher was encountered high wind speeds with cold temperature settings in survey site 1 making it difficult for her to take measurements and record responses with shaky hands hence the recorded responses for the morning in the said site is less than half the target. Problems with measuring device, specifically the anemometer, were also encountered on the third survey session during autumn. As such, wind speed readings from the meteorological station were used in the data set.

CHAPTER 4: RESULTS & DISCUSSIONS

4.1 Summary of Results

From the survey and field measurements conducted during the summer, autumn and winter seasons in Dubai, a total of 696 cases were collected. 51.1% of the respondents fall in the age bracket of 25-34 years. The second major age bracket that responded were those belonging to 35-44 years (19.8%) followed by those within 18-24 years old (17.5%). 90% of the sample population related that they are working persons in Dubai while only 3.6% and 4.5% were found to be students and tourists, respectively. Most of the respondents were found to be Asians from India (33%) and the Philippines (32.6%) as they represent majority of the commuters. UAE nationals represented 1.1% of the respondents, most of them were policemen or parking inspectors. 61% of the subjects were standing during interviews while 31.5% of them were sitting. Since the survey sites were near the bus stations, their main intention for being there was to wait for transport. The summary of the sample population is provided in Appendix D.

The ranges of the defined physical variables that were measured are indicated in Table 4.1. A database of the field measurements and responses from the survey can be found in Appendix E and Appendix F, respectively.

Table 4.1: Ranges of Measured Independent Variables

Independent variable	Ranges		
	Summer	Autumn	Winter
Air temperature (ºC)	31 - 45	20 - 38	12 - 33
Ground temperature (ºC)	27 - 65	15 - 48	8 - 46
Wind speed (m/s)	0-4	0-3.5	0-6
Relative humidity (%)	37-82	27-74	28-68
Solar radiation (mW/cm², meteorological data)	453-471	440-471	343-461

Subjective responses were categorized into five types given by Comfort Votes (CV), Heat Votes (HV), Sun Votes (SV), Wind Votes (WV), Humidity Votes (RHV). Overall, around 82% of the cases reported a positive comfort vote for all the seasons. Considering the combined effect of the seasons, it was observed in the remaining votes that the responses collected reflect relative satisfaction. This can be seen in Table 4.2 where majority of the votes were linked to neutral or ‘OK’ responses. The detailed distribution tables of votes are provided in Appendix G.

Table 4.2: Summary of Overall Votes

Overall Comfort Votes

	Frequency	Percent	Cumulative Percent
no	126	18.1%	18.1%
yes	570	81.9%	100.0%

Overall Heat Votes

	Frequency	Percent	Cumulative Percent
very cold	38	5.5%	5.5%
cold	135	19.4%	24.9%
neither cool nor warm	395	56.8%	81.6%
warm	75	10.8%	92.4%
very hot	53	7.6%	100.0%

Overall Sun Votes

	Frequency	Percent	Cumulative Percent
you'd prefer more	21	4.0%	4.0%
OK	427	81.5%	85.5%
too much sun	76	14.5%	100.0%

Overall Wind Votes

	Frequency	Percent	Cumulative Percent
stale	28	4.0%	4.0%
little wind	123	17.7%	21.7%
OK	435	62.5%	84.2%
windy	105	15.1%	99.3%
too much wind	5	.7%	100.0%

Overall Humidity Votes

	Frequency	Percent	Cumulative Percent
damp	97	14.0%	14.0
OK	497	71.6%	85.6
dry	100	14.4%	100.0

4.2 Discussions

4.2.1 Relationship of Variables

In analyzing relationships, one has to bear in mind that the four physical variables affect comfort perception in a combined manner. However, it is important to determine which variable has a more direct impact to overall comfort over other variables. To achieve this, comfort votes indicating 'yes' and neutral votes were plotted against the corresponding physical parameter per season to determine which secondary vote (HV, SV, WV or RHV) has a similar trend to the overall comfort vote (CV).

Figures 4.1 – 4.6 show the trends of different sensation votes per season as a function of temperature. During summer, it can be clearly seen that as temperature increases, heat sensation votes shift from 'neither cool nor warm' (neutral) to 'warm' or 'very hot' responses. Conversely in winter, heat sensations tent to shift from (neutral) to 'cold' as temperature decreases. The same can be observed when plotting temperatures against comfort votes indicated by the differences in percentage votes.

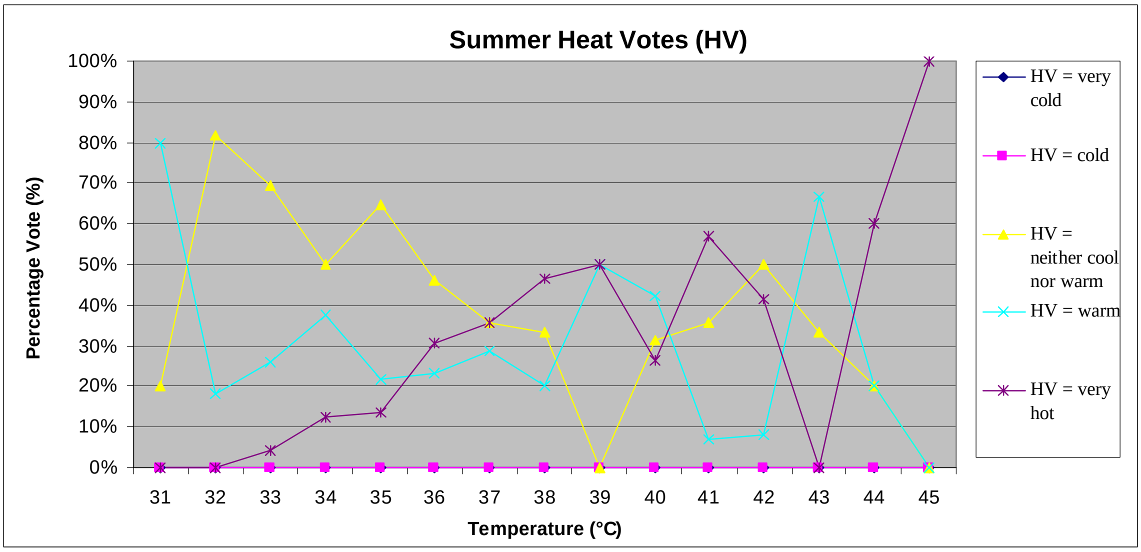

Figure 4.1: Summer Heat Votes vs. Air Temperature

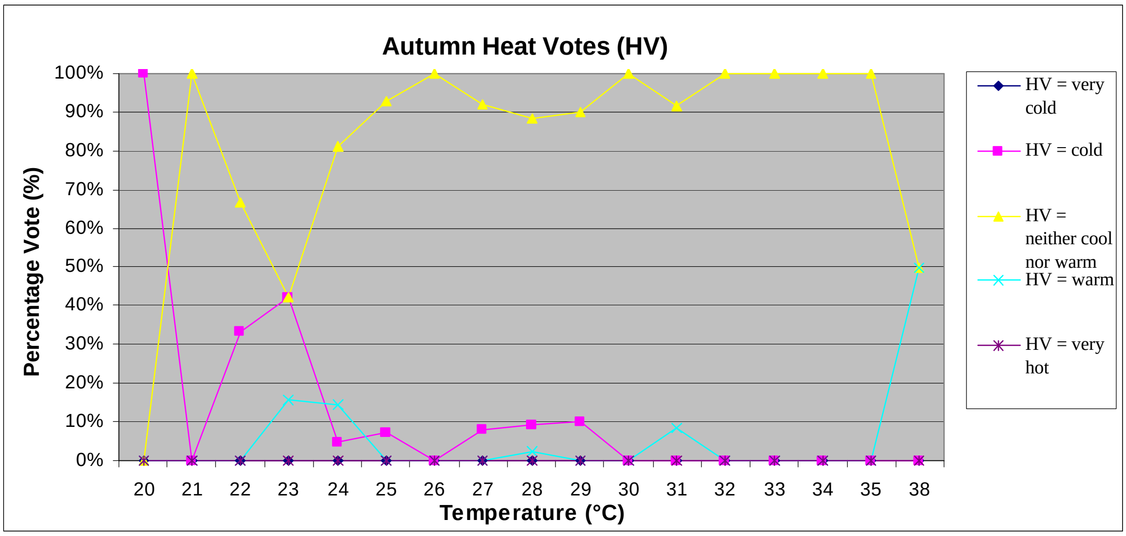

Figure 4.2: Autumn Heat Votes vs. Air Temperature

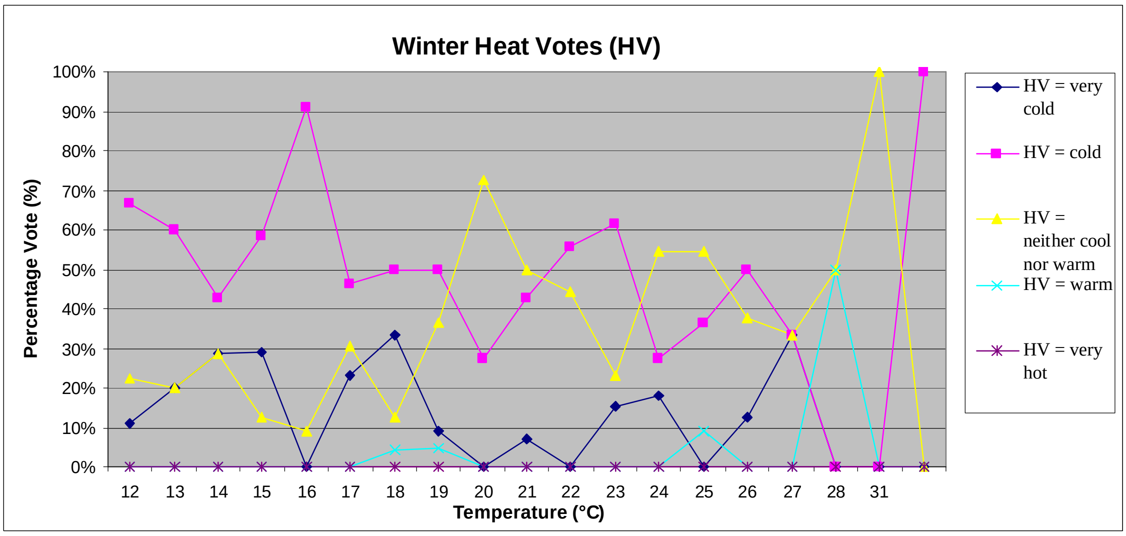

Figure 4.3: Winter Heat Votes vs. Air Temperature

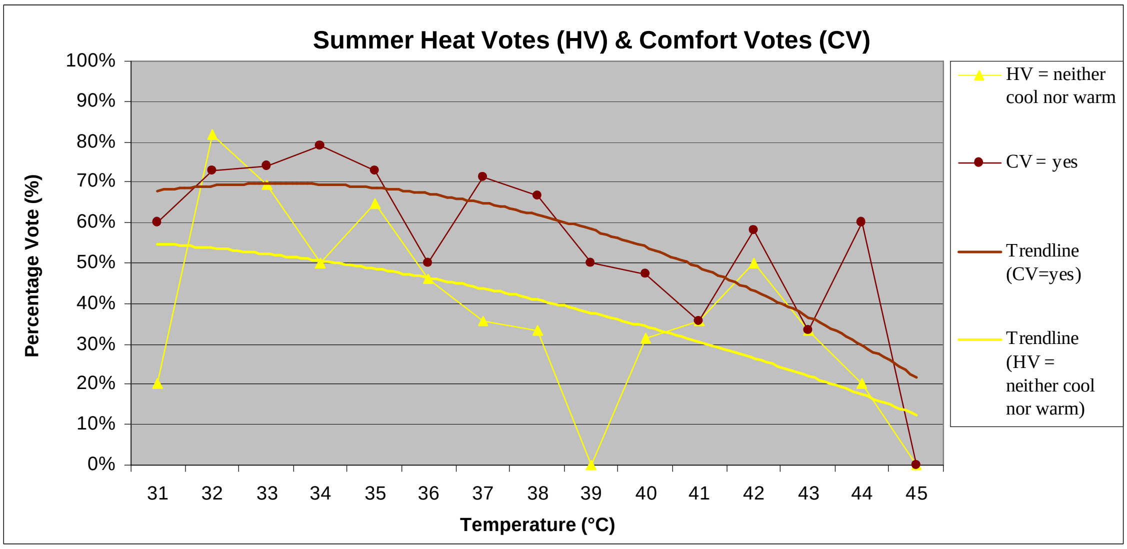

Figure 4.4: Summer Heat Votes and Comfort Votes vs. Air Temperature

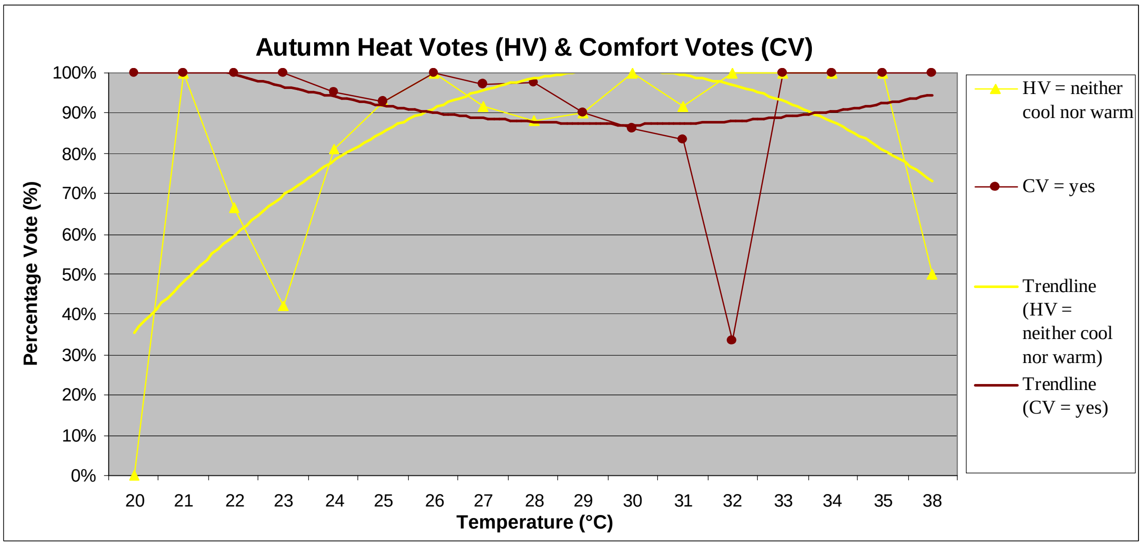

Figure 4.5: Autumn Heat Votes & Comfort Votes vs. Air Temperature

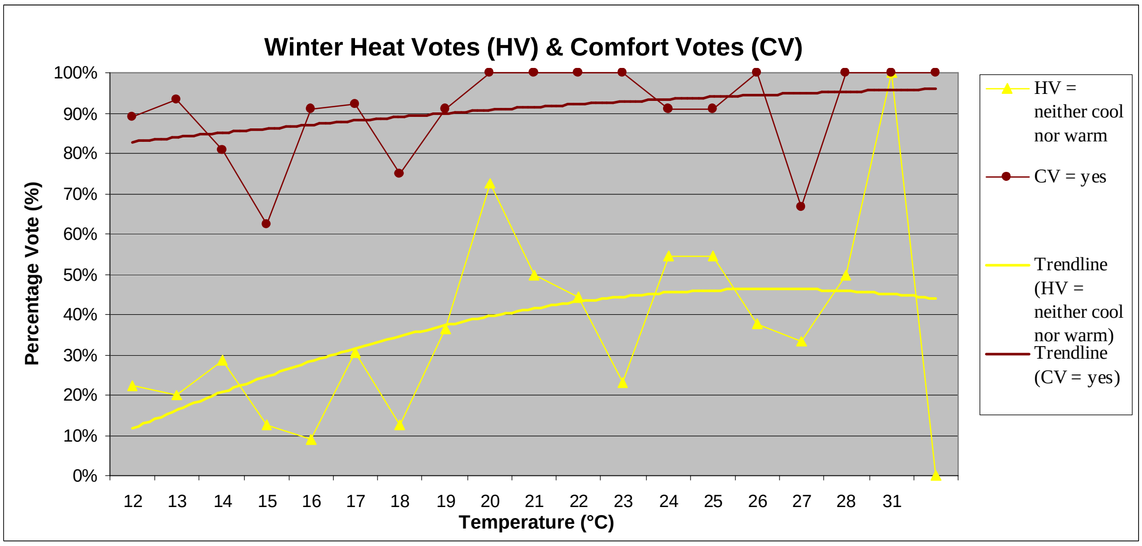

Figure 4.6: Winter Heat Votes & Comfort Votes vs. Air Temperature

Based on the results gathered per season on Figures 4.1 – 4.3, it was observed that there is an inverse relationship between temperature and comfort votes. That is, as temperature increases, the percentage of people comfortable decreases. This is in accordance with the heat balance equation discussed previously. However, when the comfort votes were plotted against the entire range of temperatures measured throughout the three seasons, lesser people reported being comfortable at lower temperatures where cold discomfort occurs.

Comparing the comfort votes between seasons, the trend tends to go down during summer, flat during autumn and upwards during winter. This shows that people are more comfortable at mid-range outdoor air temperatures specifically around 25 - 34°C.

Trend lines of heat votes and comfort votes were compared with varying temperatures. During autumn, when the environmental variables measured were at mid-range compared to the other seasons, the trend lines of comfort votes and heat votes (which corresponds to heat sensation) are near each other at temperatures higher than 26°C (Figure 4.5). These trend lines also depart from each other farther in winter (Figure 4.6). This means that although many people would report comfort at these lower temperature ranges, the variable affecting their overall comfort would not necessarily be from air temperature. At this point, it is good to discuss the effect of wind speed and solar radiation.

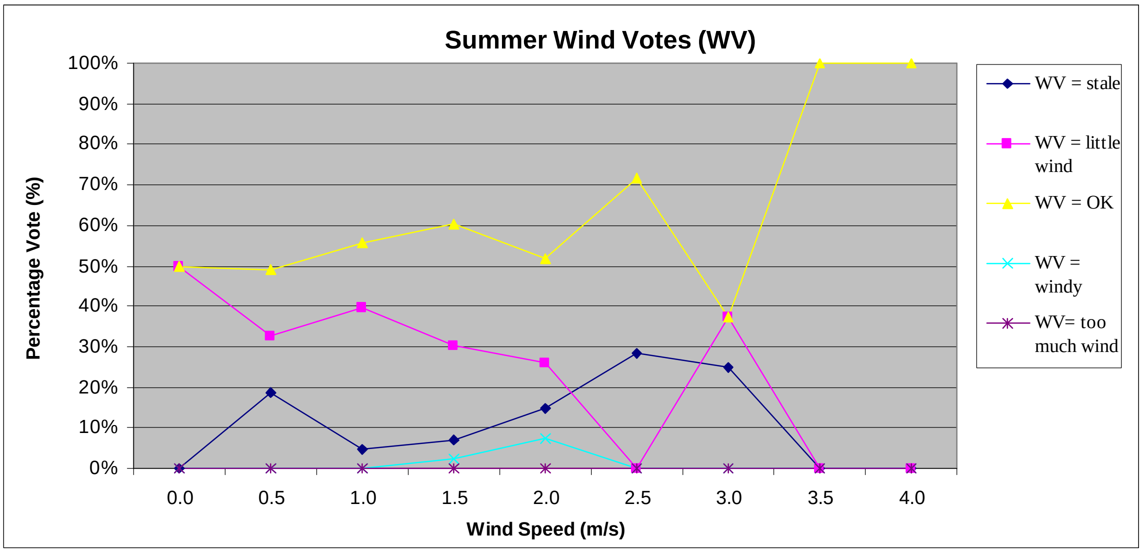

Figure 4.7: Summer Wind Votes vs. Wind Speed

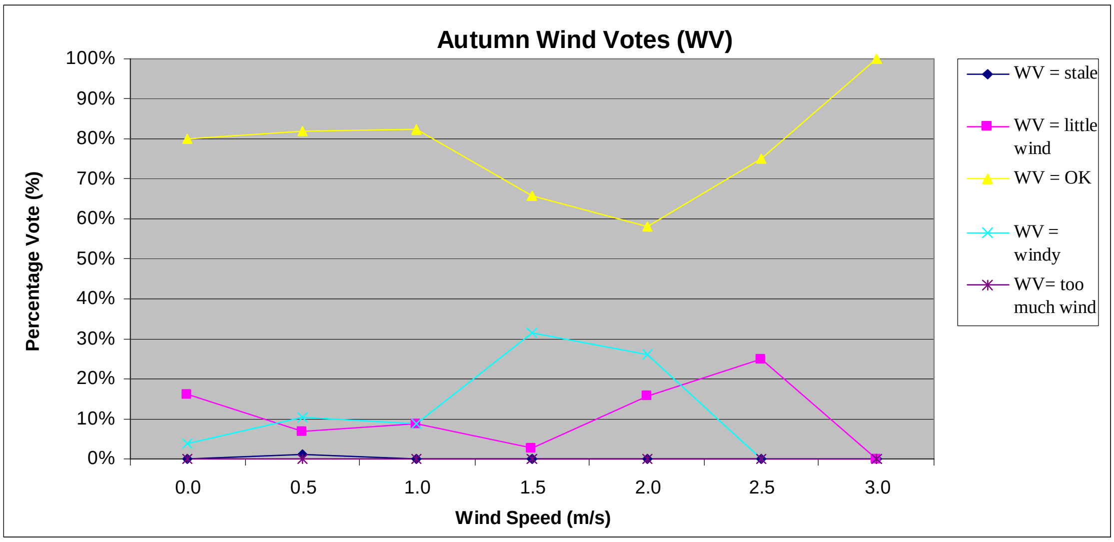

Figure 4.8: Autumn Wind Votes vs. Wind Speed

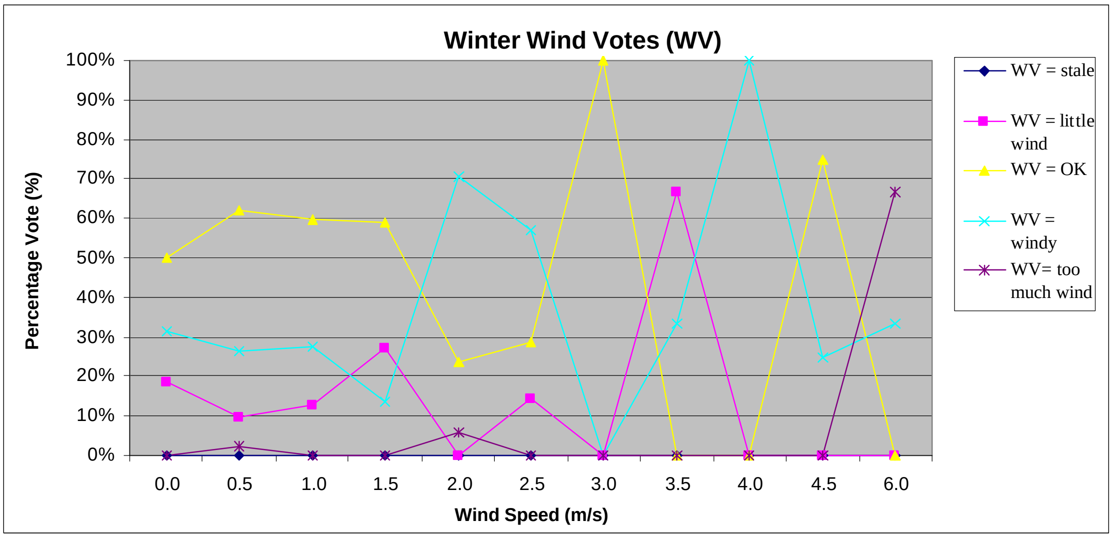

Figure 4.9: Winter Wind Votes vs. Wind Speed

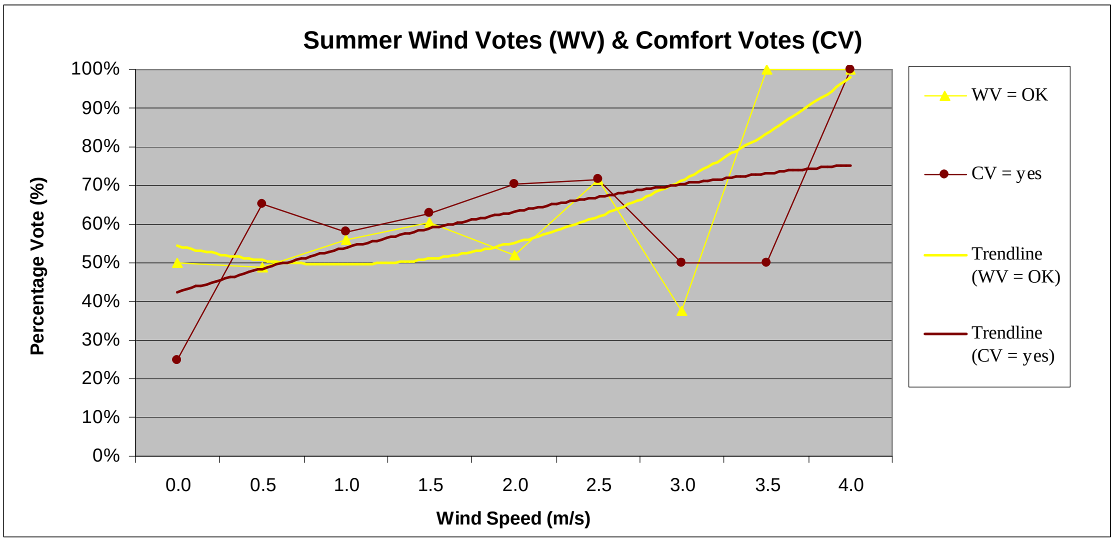

Figure 4.10: Summer Wind Votes & Comfort Votes vs. Wind Speed

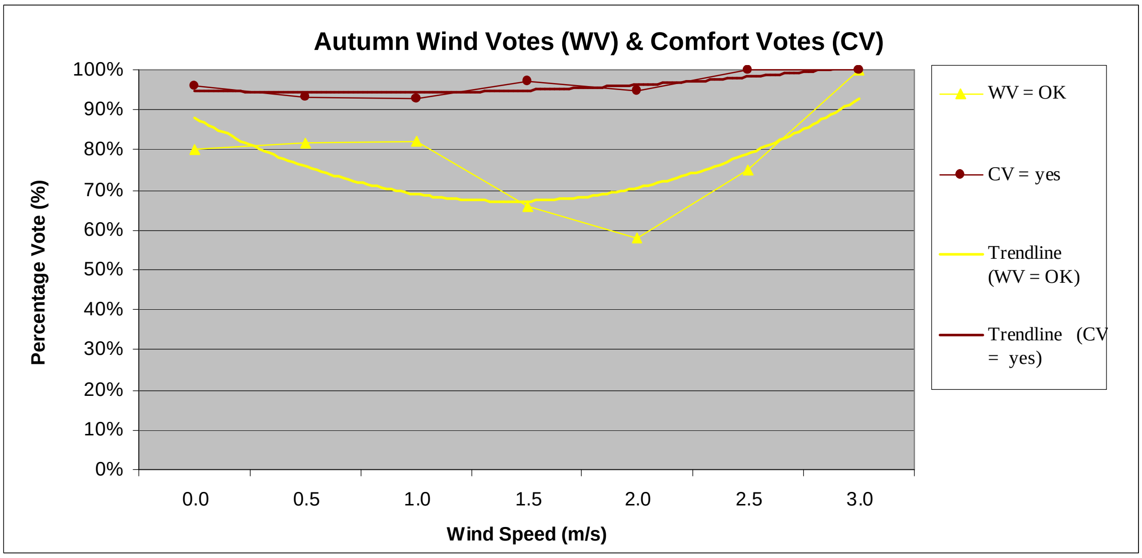

Figure 4.11: Autumn Wind Votes & Comfort Votes vs. Wind Speed

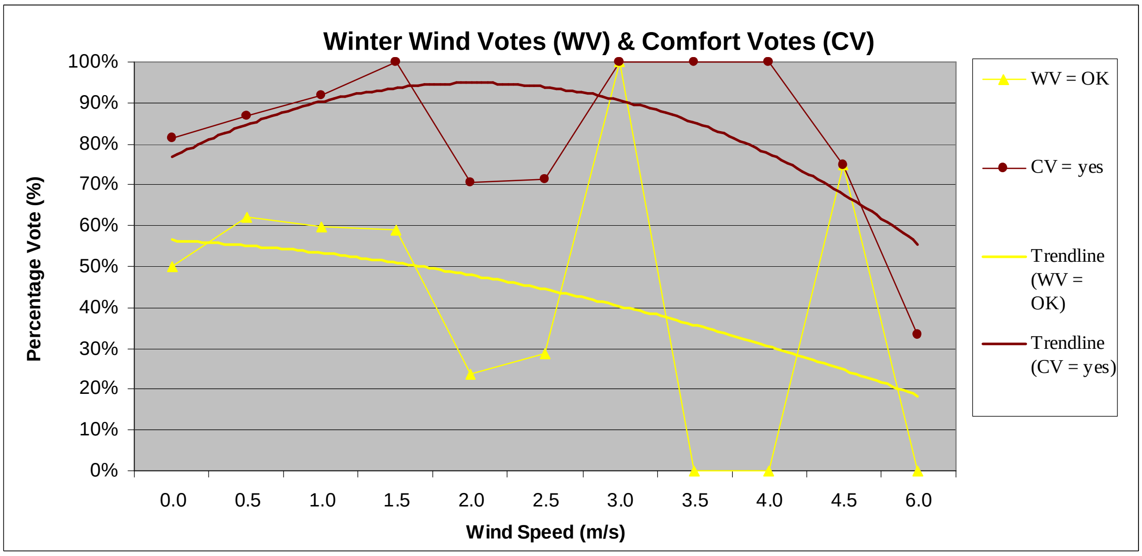

Figure 4.12: Winter Wind Votes & Comfort Votes vs. Wind Speed

Figures 4.7 – 4.12 illustrate the trends in wind and comfort votes with varying wind speeds. Note that the trend of comfort and wind votes vary every season where summer shows an upward trend, winter indicates a downward trend while autumn is comparatively flat. Figure 4.7 clearly shows that during summer, higher wind speeds allow more comfort. Given the high temperature readings in summer, the body receives high heat load from the external environment. The more wind that breezes across the body enables it to expel the surplus body heat faster through convection and evaporation from the skin thereby allowing the body to achieve thermal balance more easily. The opposite was observed during winter where comfort and wind votes tend to go lower as wind speed increases. With winter temperatures already being low, the additional cooling effect of wind makes the body lose more heat than it actually needs to store. In effect, this produces cold discomfort. It can also be noted that the trend lines of wind votes and comfort votes tend to move farther away from each other as the seasons get cooler. This means that wind has more discernible effect to comfort at higher temperatures.

Figures 4.13 – 4.18 show the trends of sun and comfort votes with the varying solar radiation levels through the different seasons. More over, it can be observed that sun votes and comfort votes are nearest or closest matches to each other when compared to the other physical variables under study (Figures 4.16 – 4.18). This illustrates that solar radiation has more direct impact to overall comfort over the others. It can also be observed that 'OK' sun votes during cooler periods of summer and winter are higher than during summer. This indicates that at lower air temperatures, the radiant heat of the sun provides the needed heat energy for the body to achieve thermal comfort levels. Comparing Figures 4.16 and 4.18 also shows this comparison where more people tend to feel comfortable with the sun during winter (upward trend) than summer (downward trend). It is also important to note that during summer, even for the downward trend, the percentage of people feeling comfortable with the sun is more than 50%. This can be attributed to the fact that majority of respondents stayed under the shade to protect themselves from direct solar radiation.

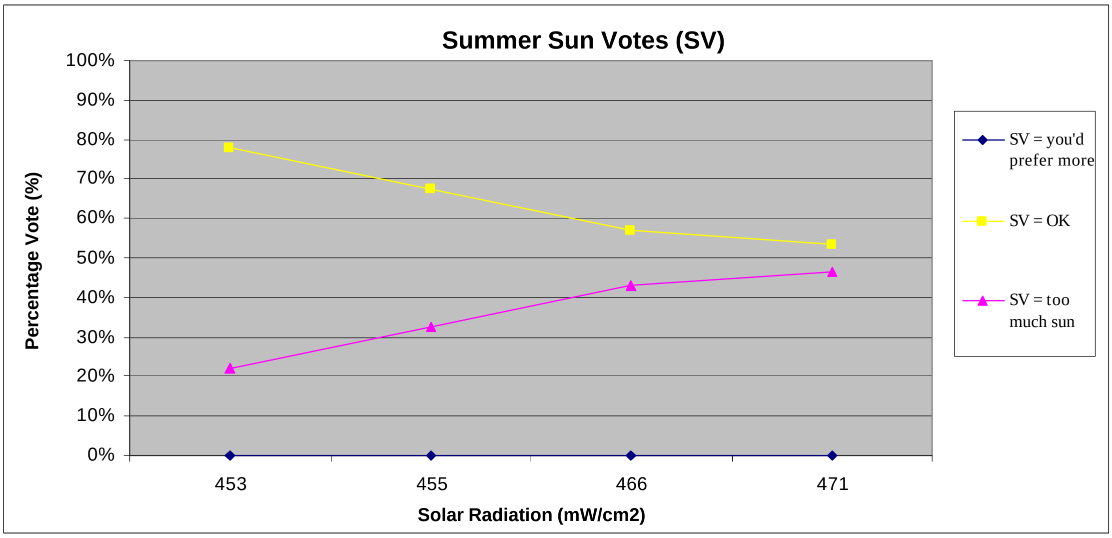

Figure 4.13: Summer Sun Votes vs. Solar Radiation

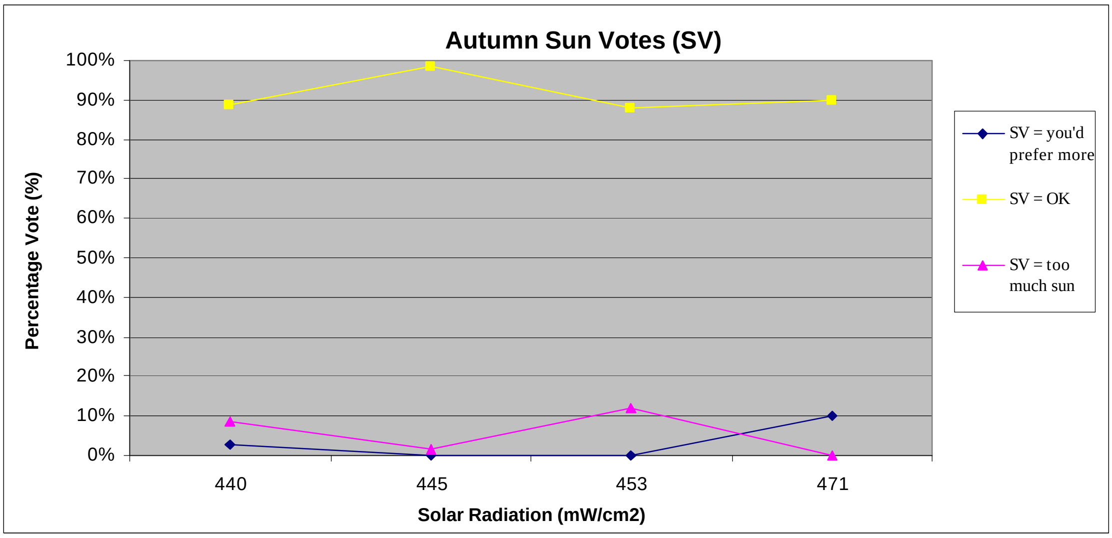

Figure 4.14: Autumn Sun Votes vs. Solar Radiation

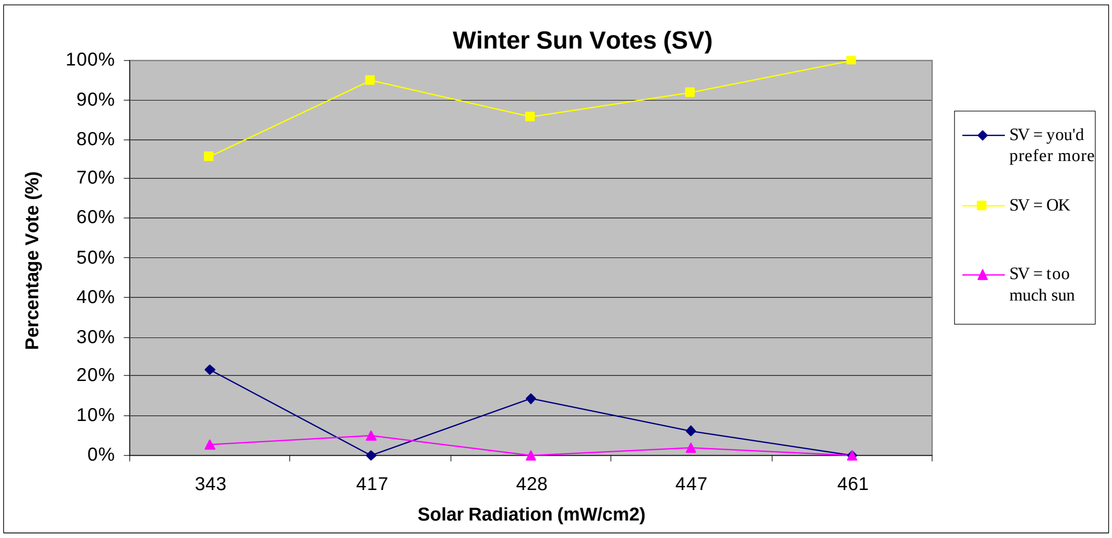

Figure 4.15: Winter Sun Votes vs. Solar Radiation

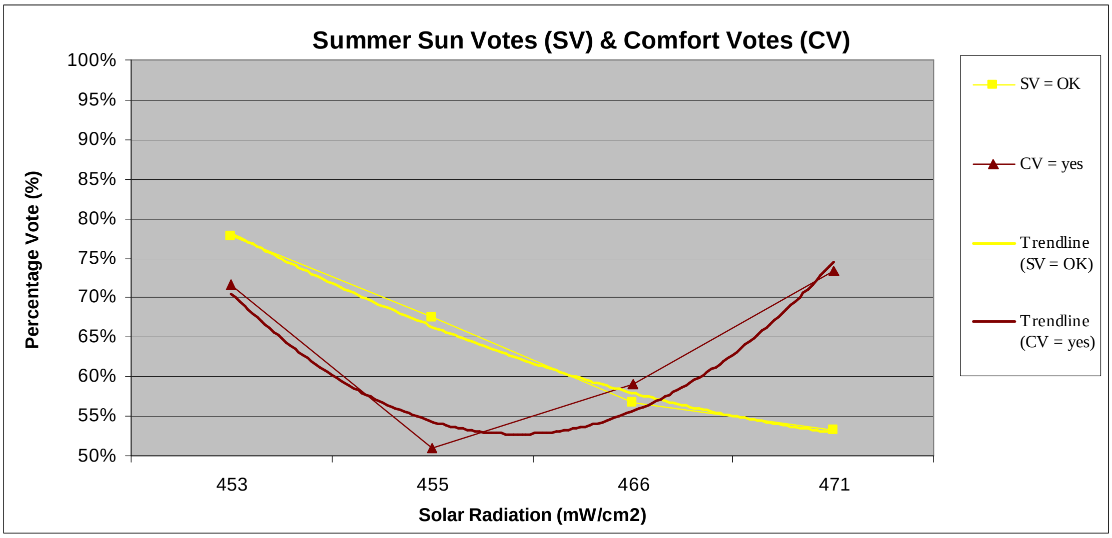

Figure 4.16: Summer Sun Votes & Comfort Votes vs. Solar Radiation

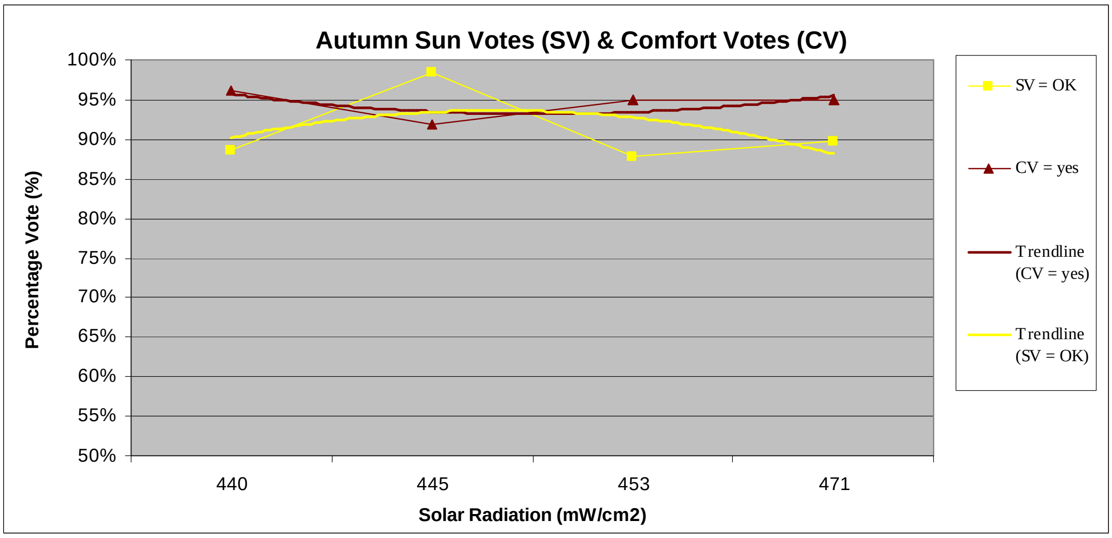

Figure 4.17: Autumn Sun Votes & Comfort Votes vs. Solar Radiation

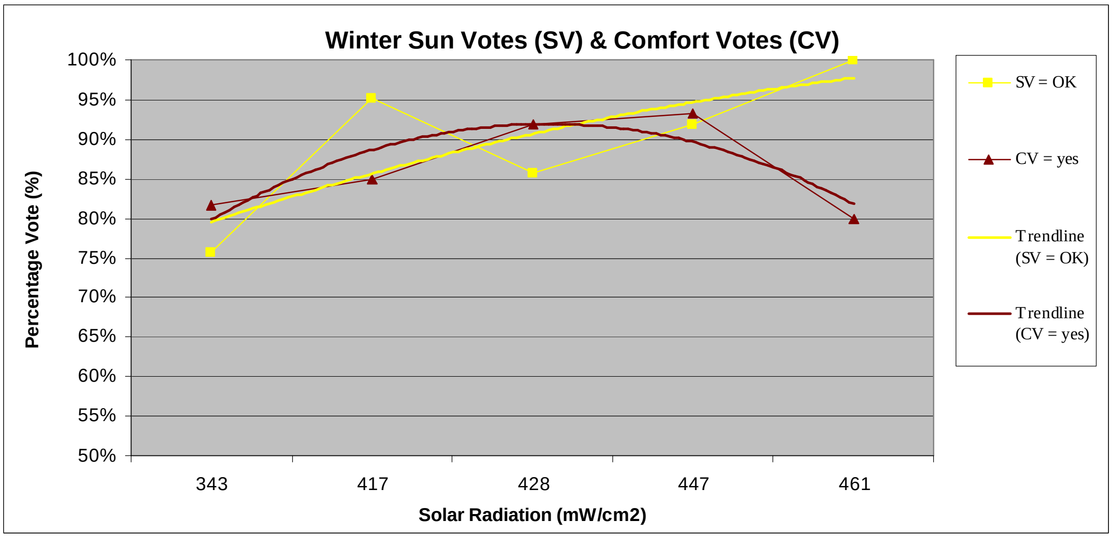

Figure 4.18: Winter Sun Votes & Comfort Votes vs. Solar Radiation

With regards to relative humidity (Figures 4.19 – 4.24), it can be observed that autumn and winter seasons reported higher percentages of people feeling comfortable with humidity than in summer. It was also observed that there is a more profound downward trend as relative humidity increases in summer. During winter, on the other hand, the trend seems to go up as relative humidity increases. It can also be noted that this illustrates that relative humidity could be an amplifying element for air temperature.

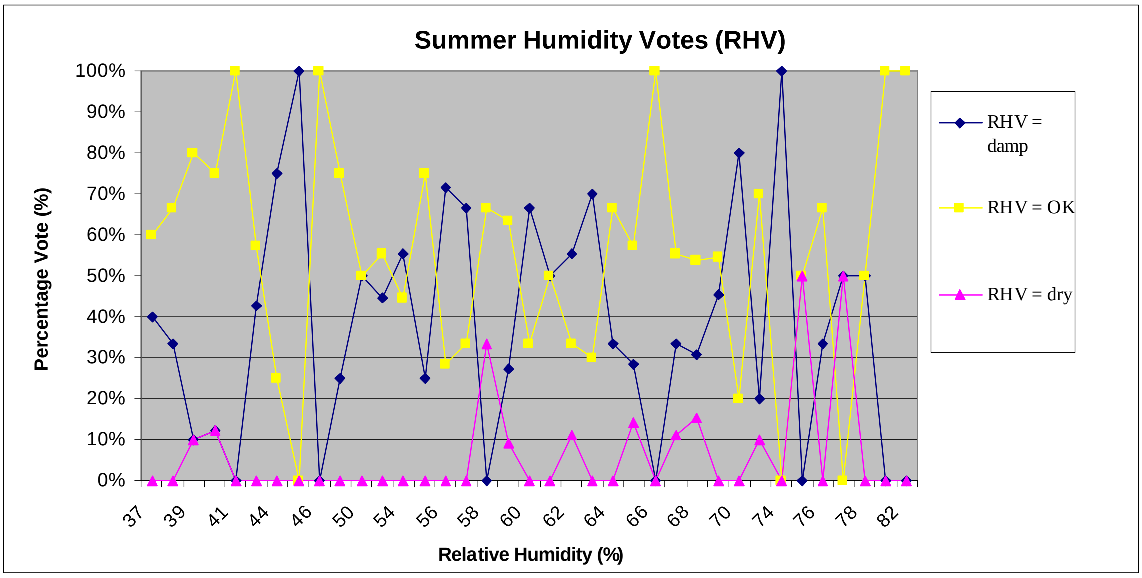

Figure 4.19: Summer Humidity Votes vs. Relative Humidity

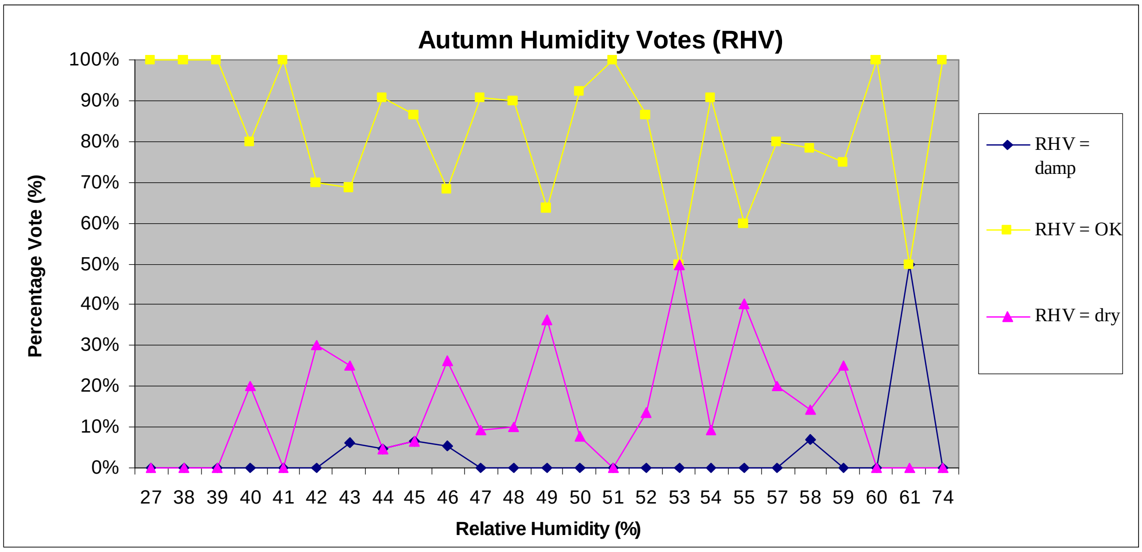

Figure 4.20: Autumn Humidity Votes vs. Relative Humidity

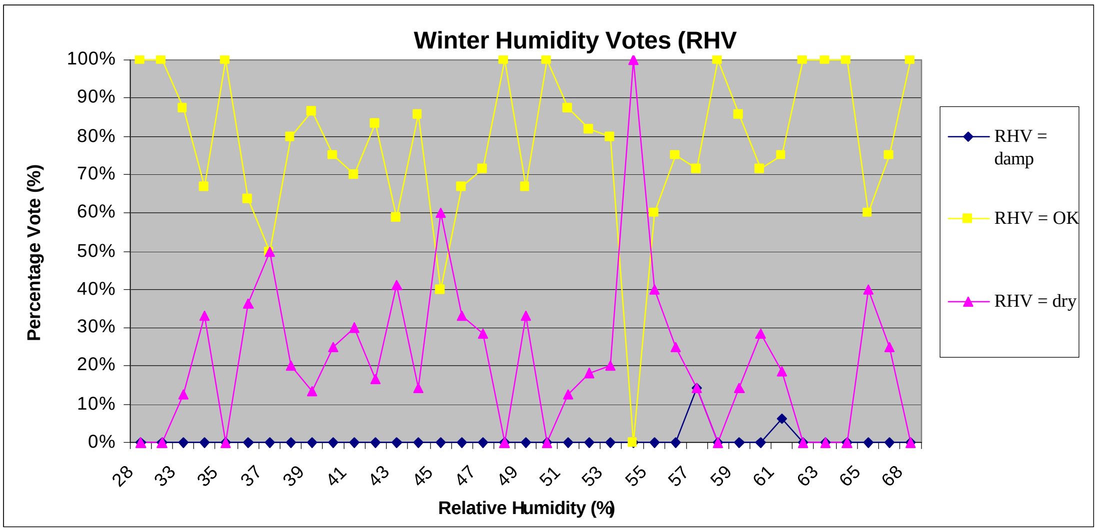

Figure 4.21: Winter Humidity Votes vs. Relative Humidity

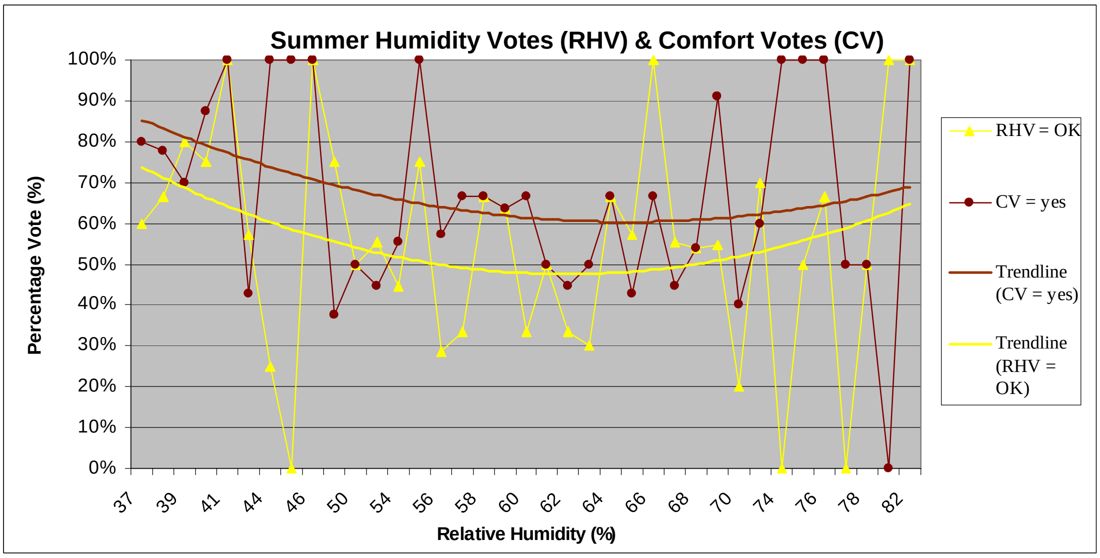

Figure 4.22: Summer Humidity Votes & Comfort Votes vs. Relative Humidity

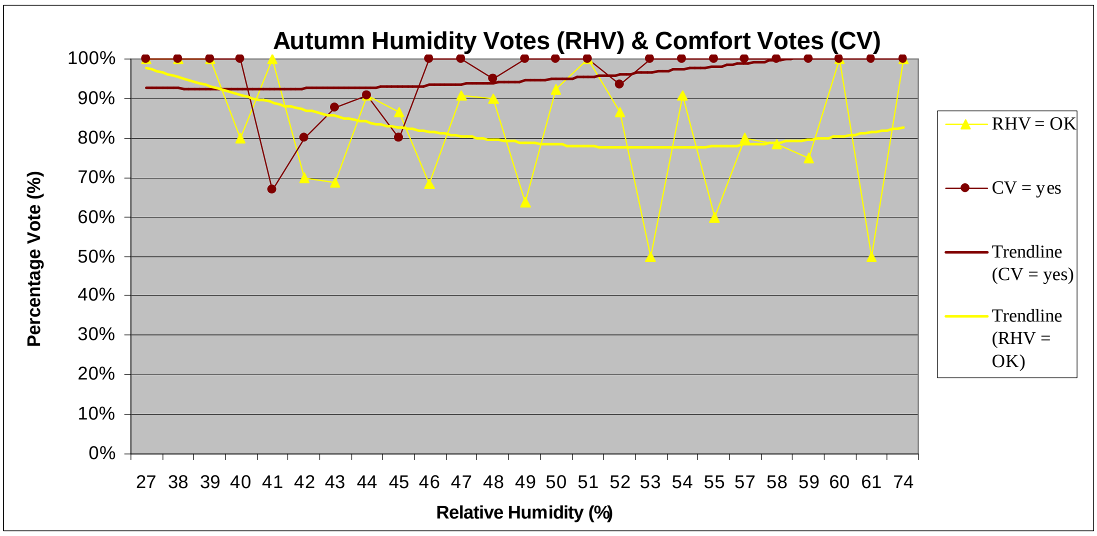

Figure 4.23: Autumn Humidity Votes & Comfort Votes vs. Relative Humidity

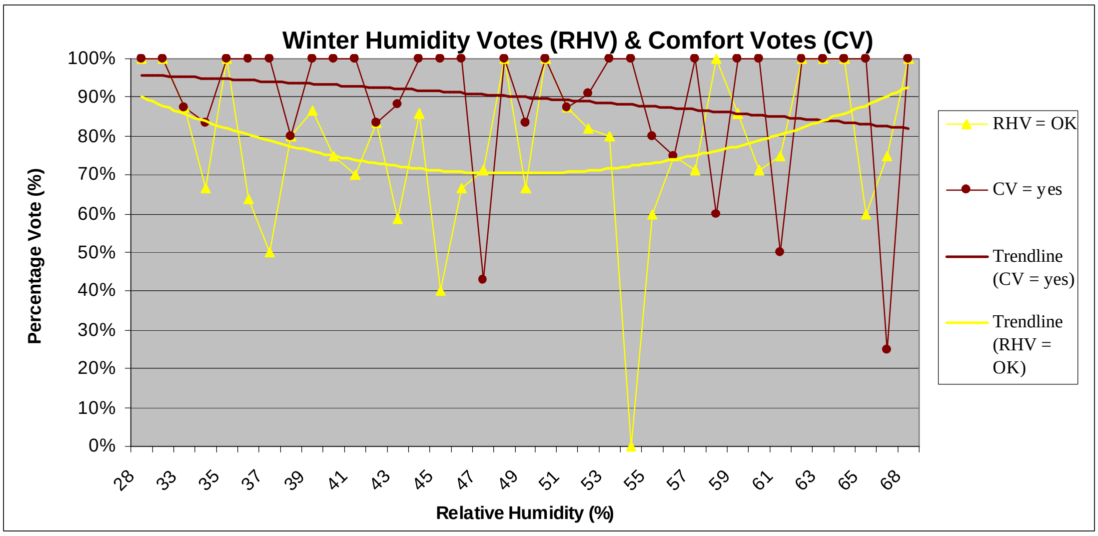

Figure 4.24: Winter Humidity Votes & Comfort Votes vs. Relative Humidity

To determine the continuous effect of different physical variables throughout the seasons, the different votes per were compared against each other. Heat votes and comfort votes per season are then compared in a unified scale of temperature as given in Figures 4.25 – 4.26. Figures 4.25 – 4.26 indicate the overall trend of heat votes and comfort votes with varying temperatures for the given climate type. It can be seen in Figure 4.25 that since autumn is at mid-range temperatures, more people were feeling neutral. The overall trend of heat votes can be described to be that of a parabola. However, the overall trend for comfort votes throughout the seasons is not similar to that of heat votes. The portion of the curve falling on the lower side of the temperature scale reflects higher votes compared to the opposite side of the scale. This shows that comfort levels are reached better at winter and autumn. Apart from the discussed significant positive effect of solar radiation to comfort for this portion of the temperature range, this higher portion of the curve can also be attributed to clothing levels which allow people to protect themselves better from cold. Comfortable air temperatures at this lower side of the scale are then augmented by clothing and solar radiation, which implies that people can adapt to cold better compared to the observed hotter temperatures.

More over, it can also be observed on the overlaps between seasons within the same temperature ranges, different percentages of comfort votes occur. This can be attributed to solar radiation where there are higher levels of solar radiation in summer thereby producing lower percentages of comfortable people (Figure 4.25 and 4.26).

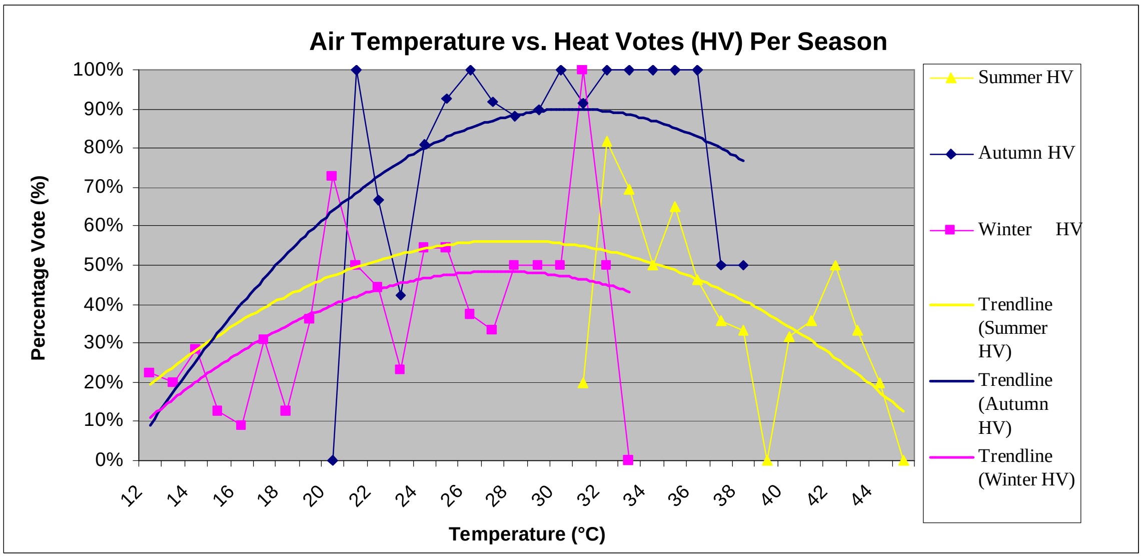

Figure 4.25: Air Temperature vs. Heat Votes per Season

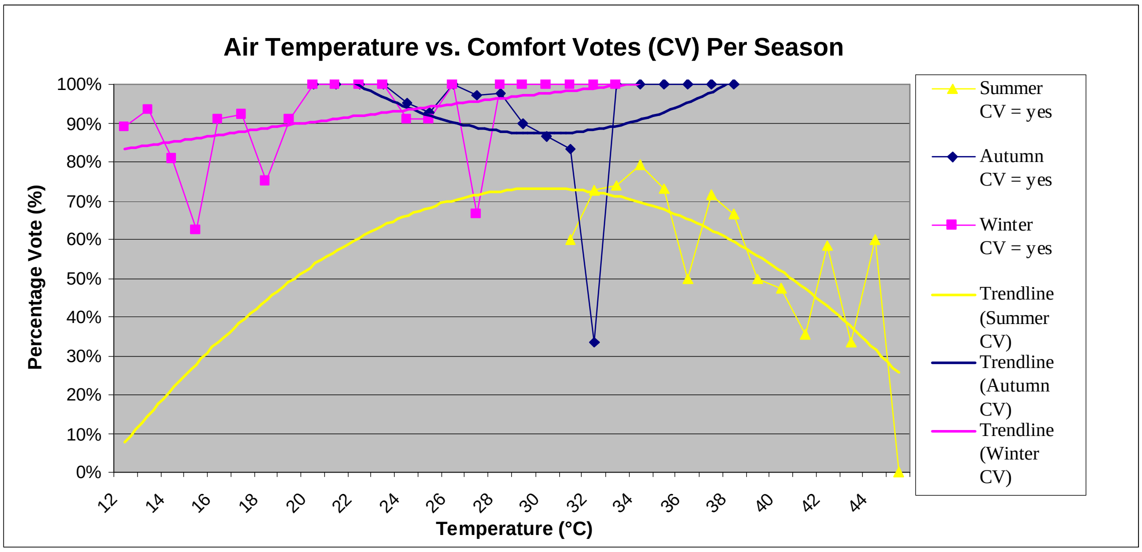

Figure 4.26: Air Temperature vs. Comfort Votes Per Season

With solar radiation being the main influencing factor for comfort, it is necessary to investigate how the combined effect of the remaining factors affect comfort. Figure 4.27 shows the plotted comfort votes against temperature and relative humidity. This shows that within 40-60% relative humidity, more people report overall comfort at temperatures around 15-32°C. While Figure 4.28 illustrates that more people feel comfortable at lower temperatures where there are low wind speeds and this disperses as temperatures increase.

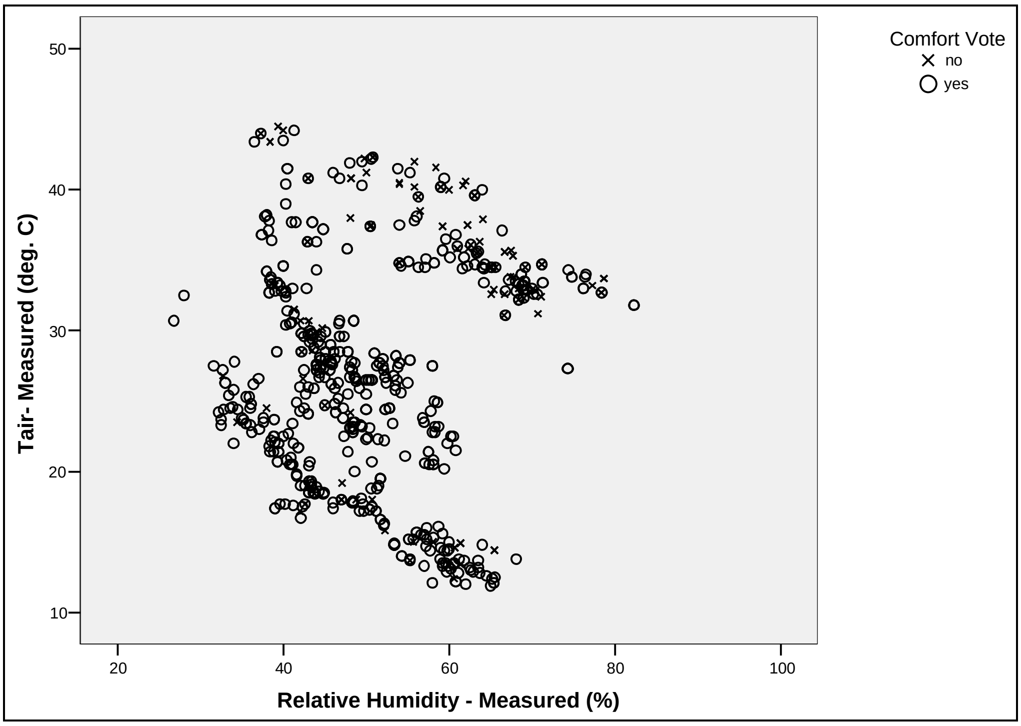

Figure 4.27: Overall Comfort vs. Temperature & Relative Humidity

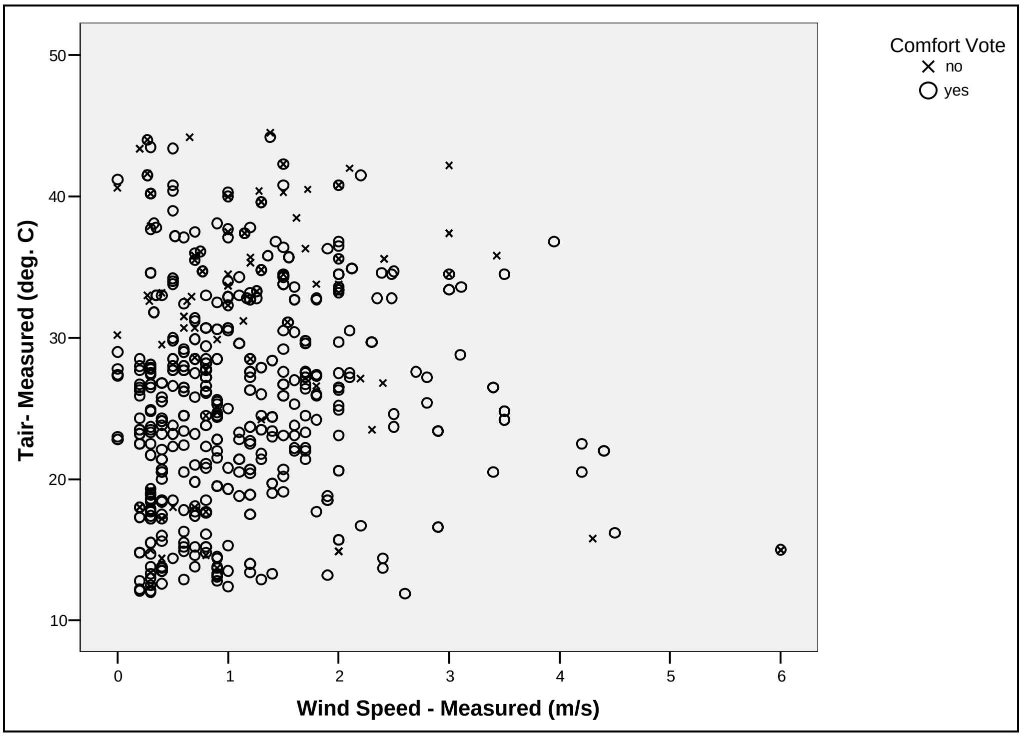

Figure 4.28: Overall Comfort vs. Air Temperature & Wind Speed

Considering clothing, the author encountered difficulty in quantifying and encoding the information on vast combination of clothing levels in each interview case. The major clothing ensemble observed throughout the seasons especially during the weekday survey sessions was the typical combination of office clothing which consists of short-sleeve or long-sleeve shirt, trousers or jeans, and closed shoes. This can be attributed to the fact that majority of the respondents are working people who wait for transport while being in the survey sites. From Table 2.1, these clothing levels can be approximated to be 0.57 clo for the short-sleeve ensemble and 0.61 for long sleeve ensemble. However, it was observed that the amount of clothing levels varied per season with winter being the time when most respondents wore more layers of clothing compared to summer and winter. At the very least, the clothing level for winter can typically go up to 0.97 clo. This factor contributed to protection from the colder temperatures of winter as well as protection from wind gusts. During summer, it was also observed that people still prefer to wear long-sleeve shirts. This can be due to two reasons: long-sleeve shirts provide protection from direct solar radiation and this is popular clothing used at work.

In view of activity, around 61% of the respondents throughout the three seasons were standing while around 30% and 8% were observed to be sitting and walking, respectively. The comparison is illustrated in Figure 4.29. This can be attributed to the fact that the survey sites were near bus stops and most people would wait standing up especially when the available limited seats in the waiting area were all occupied. Standing also gave them the advantage of staying under the shade in the form of shadows from buildings, bus stops, parking meters and even street poles where no seating is available. In conjunction with this, it is also important to note in Figure 4.30 that majority of the subjects stayed under the shade in all the seasons observed. This reinforces the previous discussion on the impact of solar radiation to thermal comfort where people would generally seek available shading to protect themselves from uncomfortable exposure to the sun.

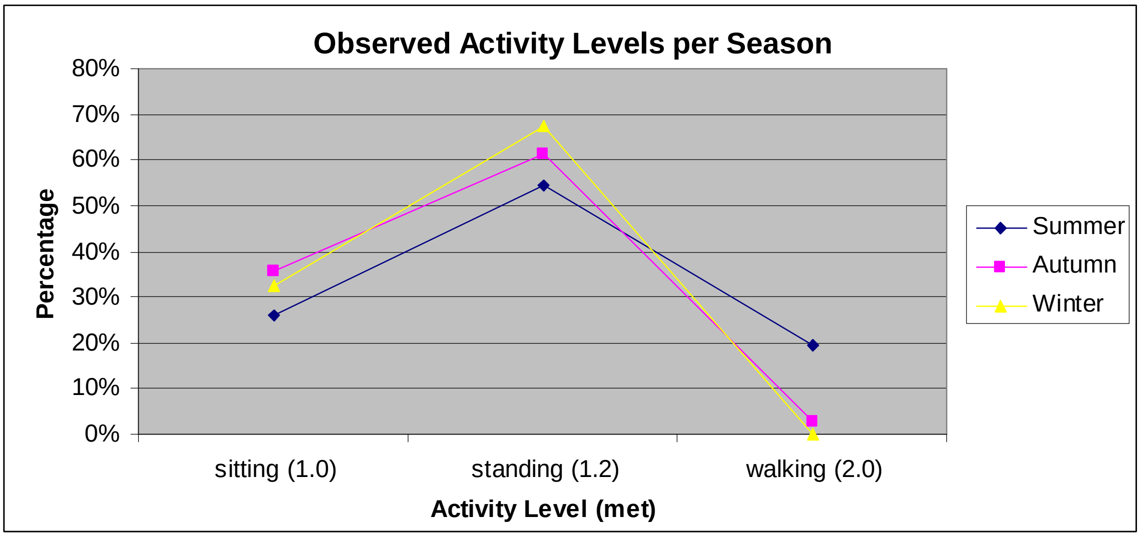

Figure 4.29: Observed Activity Levels per Season

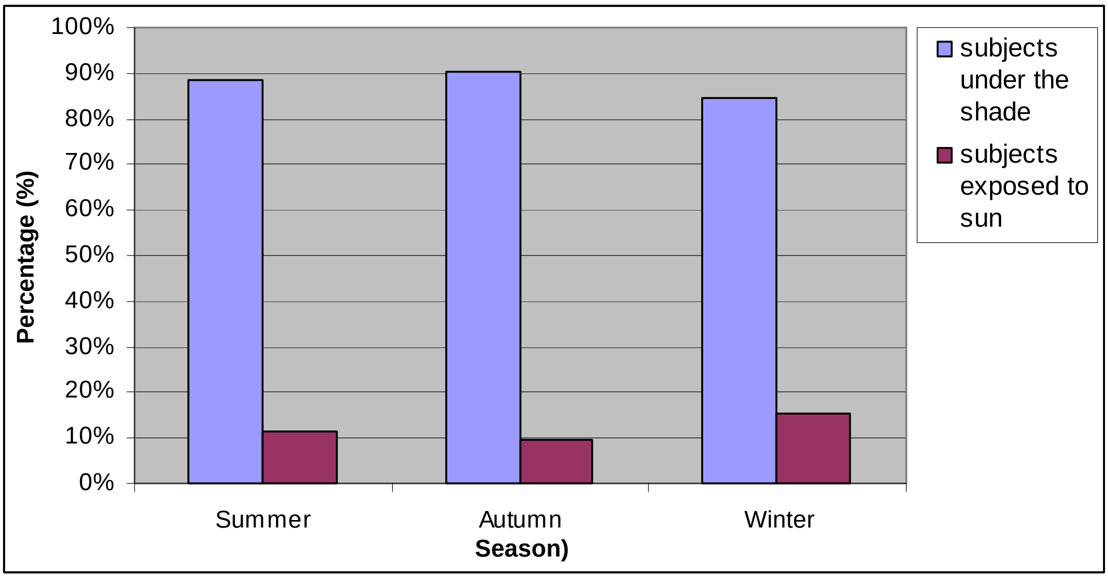

Figure 4.30: Sun Exposure per Season

4.2.2 Recommended Conditions and Design Suggestions

As recommended by Ahmed (2003) and Nikolopoulou (2006) recommended conditions for outdoor thermal comfort are better defined as ranges compared to the exacting conditions defined for indoors. Based on the findings discussed in the previous section, the recommended conditions for outdoor thermal comfort in Dubai for the extreme seasons are as follows (assuming 60% approval):

(1) For summer, with proper clothing, under shaded conditions, and 40-60% relative humidity, comfortable air temperatures can range up to 36°C. This can be augmented further up by higher wind speeds and lower relative humidity.
(2) For winter, with proper clothing, under still air conditions, and direct exposure to the sun, air temperature ranges can be from 12-39°C.

Shading during summer is recommended as top priority while exposure to sun during winter helps alleviate the cold sensation due air temperature. High wind speeds are encouraged during summer while protection from high wind speeds is recommended for winter.

Given the conditions above, it is strongly suggested that design of outdoor spaces in Dubai consider the impact of air, wind and sun. This can be achieved by using widely accessible tools such as the wind rose and solar chart for Dubai (Figures 4.31 – 4.32). It can be seen from the wind rose that 20-30 kph wind speeds come from the north-west for many parts of the year, however it is also beneficial to take advantage of stronger wind speeds coming from all directions within the year. As a start, this can be achieved by careful consideration of alignment of streets, differences in heights of buildings and varying width of streets. Design for shading can also be achieved using the solar chart where it can be seen during summer, sun angles are perpendicular at mid-day hours. Shading can be achieved by the use of trees, buildings, street furniture or shelters, and many other design possibilities.

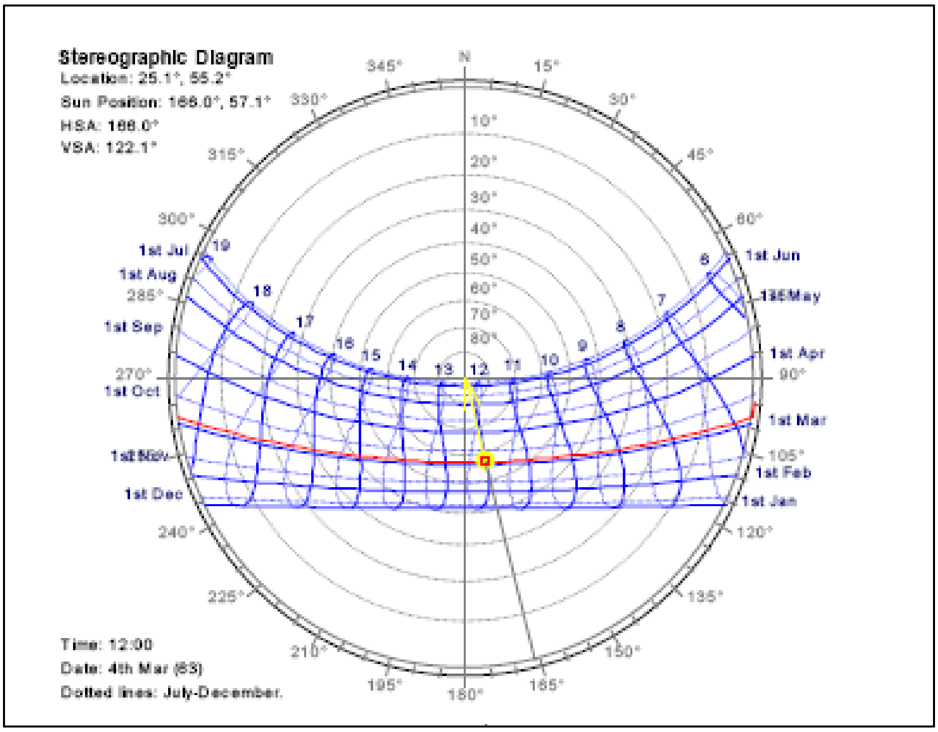

Figure 4.31: Solar Chart for Dubai, UAE. Source: Ecotect (2009)

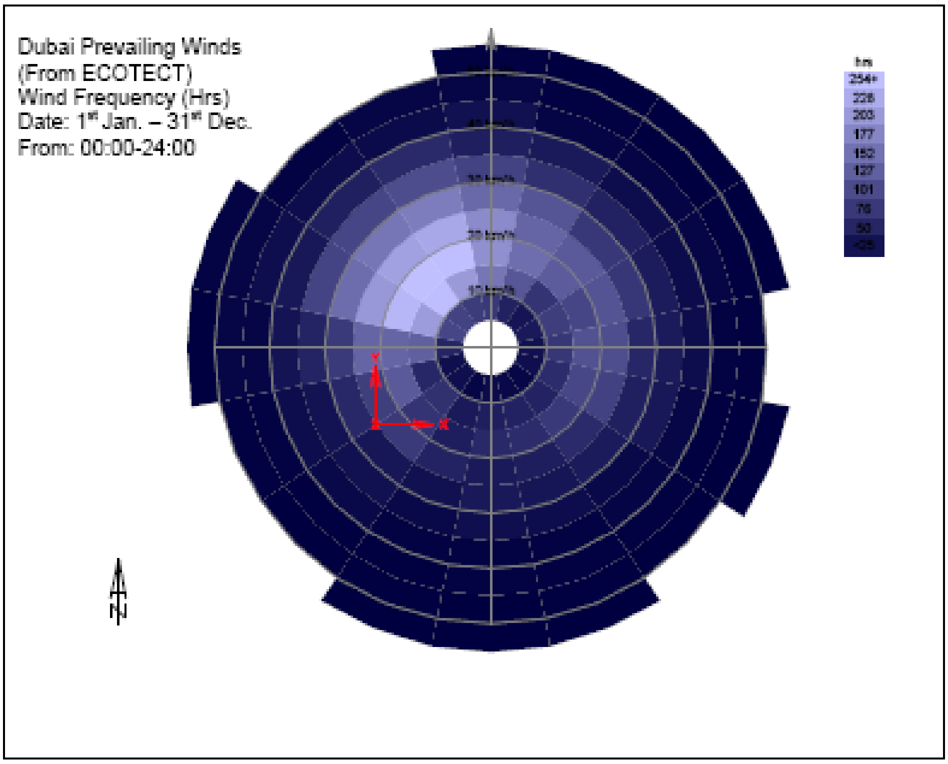

Figure 4.32: Wind Rose for Dubai, UAE. Source: Ecotect (2009)

Lastly, the combined effect of temperature, wind speeds and relative humidity can be defined to determine the comfort zone for the given area under study. Typical psychrometric charts provide the comfort zone for a particular location based on calculations from lab-based PMV studies suitable for indoors discussed in Chapter 2. In reality, however, this would not be the case given the actual perception of people outdoors. Figure 4.31 shows the plotted actual comfort zone based on the study in Dubai overlaid on the comfort zone from ASHRAE calculations using the Psychtool.

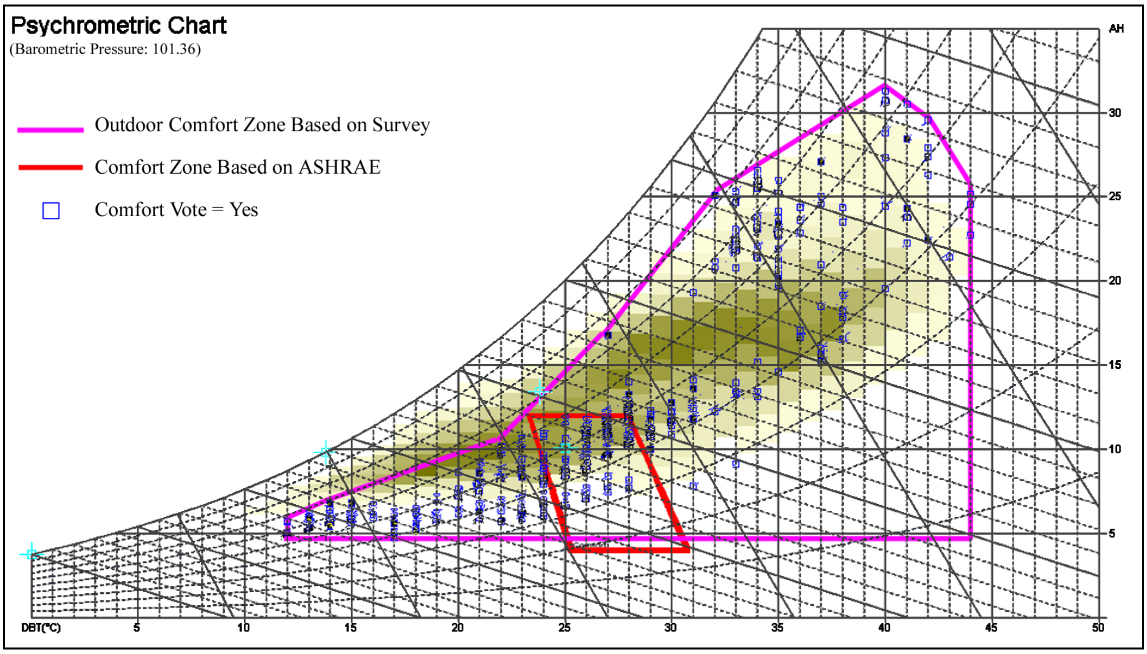

Figure 4.33: Plotted Thermal Comfort Zone for Outdoors in Dubai, UAE

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

With the aim of determining the comfortable outdoor conditions for a hot-arid climate, the findings of the study conducted in Dubai through field measurements and interview surveys indicate solar radiation as having the most direct influence on overall thermal comfort. This strongly suggests the need for shading especially during summer when designing for outdoors. The next influencing factor is that of air temperature which is seen as amplified or augmented by relative humidity and wind speed. Humidity amplifies the heating effect of air temperature. Therefore higher humidity levels are recommended for winter. Wind is more discernible to overall comfort at higher speeds given a higher temperature. Therefore wind circulation is strongly encouraged during summer while protection from it is recommended for winter.

The thermally comfortable ranges for outdoors in the Dubai is then defined for summer as less than 36ºC at 40-60% relative humidity, under shaded conditions with light clothing levels. This can be augmented further by higher wind speeds and lower relative humidity. Thermally comfortable range for outdoors in winter is also defined as having air temperatures of 12-39ºC with proper clothing, under sun exposure and minimal wind speeds.

Contrary to the common impression that the hot-arid climates in the Middle East are unbearable giving the usual convenient solution of enclosing air-conditioned spaces, the study illustrates the fact that people outdoors have a wider tolerance for outdoor conditions than what is expected based on the psychrometric chart. This should be seriously taken by designers as an advantage and opportunity to design outdoor spaces to allow people to spend more time outdoors than usual. With careful design consideration of the conditions defined in the study, outdoor thermal comfort can be achieved for longer periods of the year.

5.2 Recommendations for Further Studies

As a further step, it is recommended that future studies be done with more resources, especially manpower and electronic encoding instruments, to determine actual comfort conditions in Dubai for the whole year with even more respondents. It is also recommended to investigate the effect of street vegetation to outdoor comfort as it was observed in the surveys in Satwa that people tend to seek shelter under the trees in the green strip in the middle of the road more than the actual bus stop. In the pursuit of developing more design strategies for outdoor thermal comfort, it is also recommended that comfort conditions in old neighborhoods i.e. heritage sites which originally used passive design techniques be investigated as this could provide enriching design possibilities for future design of Dubai streets. Given the current issue of climate change, it is also recommended to investigate how the thermal comfort perception of people is affected by changes in climate over the years. Lastly, it is also recommended to investigate the inter-relationship of outdoor thermal comfort with the people's use of building controls indoors and also with the building's energy performance. Insights for this future endeavor can give way to making passive design strategies possible for longer periods of the year.

GLOSSARY

Adaptation: The gradual decrease of the organism's response to repeated exposure to a stimulus, involving all the actions that make them better suited to survive in such an environment.

Adaptive model (adaptive approach): The study of thermal comfort which starts from the observation that there are a range of actions that people can take to achieve thermal comfort, and that discomfort is caused by constraints imposed on the range of actions by social, physical and other factors.

Adaptive processes: The range of actions that people take to achieve thermal comfort.

Air-conditioning: Though strictly defined as control over the internal environment of a building by mean of controlling the thermal characteristics of the air supplied to it by the ventilation system, air-conditioning is usually taken to mean "cooling".

ASHRAE scale: A set of seven (or nine) descriptors of subjective response from (Very) Hot to (Very) Cold.

ASHRAE Standard 55: A temperature standard proposed by the American Society of Heating, Refrigeration and Air-conditioning Engineers based on the Gagge's Standard Effective Temperature.

Bedford Scale: A set of seven descriptors of subjective response from 'Much Too Warm' to 'Much Too Cool', differing from the ASHRAE scale in defining the central three categories as Comfortable.

Climate Chamber: A laboratory in which the environmental conditions can be changed by the experimenter; widely used to investigate the effects of the thermal environment on subjects.

Clothing insulation: The effective insulation of clothing worn characterized as a single layer covering the whole body surface; measured in clo units (= 0.155 m^2/W)

Comfort Temperature (neutral temperature): The temperature (or environment) judged by a population to be neutral on the ASHRAE scale, or Comfortable, Neither Warm nor Cool on the Bedford Scale: assumed by most workers in the field to be the desired temperature.

Comfort vote: The subjective response given by a subject on the comfort scale such as the ASHRAE or Bedford scales.

Comfort Zone: The range of temperature within which a subject will feel comfortable, though not necessarily neutral

Constraints: Factors in the physical or social environment which prevent people from taking actions to achieve thermal comfort.

Descriptive Scale: A subjective scale in which the subject is asked to choose between a given list of descriptions in casting a comfort vote.

Environmental Controls: Means by which the physical environment can be controlled: these may be mechanical, e.g. heating or cooling systems, fans, etc., or passive such as openable windows, blinds, etc.

Free-running building: A building which is not being mechanically heated or cooled.

Heat balance model (of thermal comfort): A model of human thermal response based on the assumption that a necessary condition for thermal comfort is a balance between the metabolic heat production and the heat loss from the body (generally an analytical model).

Metabolic rate: The rate of heat production by the body when engaged in various tasks, often defined in terms of the resting metabolism (mets).

Micro-climate: The climate in the immediate vicinity of the building.

Neutral Temperature: The temperature which corresponds to thermal neutrality, i.e. where people feel neither warm nor cold.

Physiological Equivalent Temperature (PET): The air temperature at which, in a typically indoor setting (without wind and solar radiation), the heat budget of the human body is balanced with the same core and skin temperature as under the thermal conditions outside with his own experience indoors.

Preference vote: The response by a subject as to their preference at the time of asking; this may be a preference for a warmer or cooler environment, or for a particular response on a comfort scale.

Predicted Mean Vote (PMV): The average comfort vote predicted by a theoretical index for a group of subjects when subjected to a specified set of environmental conditions taking account of their clothing and metabolic rate.

A thermal sensation index, based on the heat balance of the human body, that predicts the mean value of the votes of a large group of persons on a 7-point thermal sensation scale. It is based on environmental parameters, such as air temperature, mean radiant temperature, wind speed and air humidity, as well as metabolic rate and clothing insulation. (ISO 7730, 1994)

Predicted Percentage Dissatisfied (PPD): The percentage of subject population who will be dissatisfied (uncomfortable) in a given environment as predicted by a theoretical index.

Steady-state model (of thermal comfort): A theoretical model of thermal response based on climate chamber measurements in conditions which are held constant in time.

Subjective response: The sensation caused by a physical stimulus (generally a comfort vote).

Survey (comfort survey, field survey): An experimental investigation of subjective responses of a group of subjects in the field, generally assumed to be undertaken in such a way as to disrupt the normal pattern of the subjects' lives as little as possible, and to leave subjects to decide their own clothing and activity, use of environmental controls, and so on.

Temperature standards: Recommended values for temperature (and other environmental parameters) in buildings or rooms, values generally defined by the expected use of the room.

Thermal comfort: The study of the relationship between our thermal sensation and the stimulus in the form of the thermal environment in conditions of moderate heat stress (generally taken to include thermal discomfort).

Thermal experience: The different thermal environments experienced by a subject, taking into account of the order in which they occurred.

Thermal performance: The characteristic way in which a building reacts to the thermal climate.

Thermo-regulation: The various physiological means by which the core temperature is regulated: vasodilation/constriction, sweating and shivering.

Source: Parsons (2003)

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APPENDICES

Appendix A: Predicted Mean Vote (PMV) values

Table 8.6 Predicted mean vote (*PMV*) values from Fanger (1970). Assume $rh = 50\%$; still air; and $t_a = t_r PMV$: +3, hot; +2, slightly warm; +1, warm; 0, neutral; −1, slightly cool; −2, cool; −3, cold

$t_a = t_r$	I_{cl}, Clo						
	0.1	0.3	0.5	0.8	1.0	1.5	2.0
$M = 1$ Met; var $= 0.1\ m\ s^{-1}$							
10						−2.2	−1.4
12						−1.8	−1.0
14					−2.5	−1.4	−0.7
16				−2.5	−1.9	−1.0	−0.3
18				−1.9	−1.4	−0.5	0.0
20			−2.3	−1.3	−0.9	−0.1	0.4
22		−2.3	−1.5	−0.7	−0.3	0.4	0.8
24	−2.3	−1.4	−0.8	−0.1	0.2	0.8	1.1
26	−1.2	−0.5	0.0	0.6	0.8	1.2	1.5
28	−0.1	0.4	0.8	1.2	1.4	1.7	1.9
30	1.0	1.3	1.6	1.8	1.9	2.1	2.3
32	2.0	2.2	2.3	2.4	2.5	2.6	2.6
$M = 1.2$ Met; var $= 0.1\ m\ s^{-1}$							
10					−2.7	−1.6	−0.9
12				−2.8	−2.2	−1.2	−0.6
14				−2.3	−1.8	−0.9	−0.3
16			−2.8	−1.8	−1.3	−0.5	0.0
18		−2.9	−2.1	−1.2	−0.8	−0.1	0.3
20		−2.2	−1.5	−0.7	−0.4	0.2	0.6
22	−2.3	−1.4	−0.8	−0.2	0.1	0.6	0.9
24	−1.4	−0.7	−0.2	0.3	0.6	1.0	1.3
26	−0.5	0.1	0.4	0.8	1.0	1.4	1.6
28	0.4	0.8	1.1	1.3	1.5	1.7	1.9
30	1.3	1.5	1.7	1.8	1.9	2.1	2.2
32	2.0	2.1	2.2	2.3	2.3	2.4	2.4
$M = 1.6$ Met; var $= 0.1\ m\ s^{-1}$							
10				−2.0	−1.5	−0.7	−0.2
12			−2.6	−1.6	−1.2	−0.4	0.0
14		−2.9	−2.1	−1.3	−0.9	−0.2	0.3
16		−2.4	−1.7	−0.9	−0.5	0.1	0.5
18	−2.8	−1.8	−1.2	−0.5	−0.2	0.4	0.7
20	−2.1	−1.3	−0.7	−0.1	0.2	0.6	0.9
22	−1.4	−0.7	−0.2	0.3	0.5	0.9	1.2
24	−0.7	−0.2	0.2	0.7	0.8	1.2	1.4
26	0.0	0.4	0.7	1.1	1.2	1.5	1.6
28	0.7	1.0	1.2	1.5	1.6	1.8	1.9
30	1.4	1.6	1.7	1.9	1.9	2.0	2.1
32	2.1	2.2	2.2	2.3	2.3	2.3	2.4

- Assume relative humidity = 50%, still air conditions, air temperature is equal to radiant temperature
- +3, hot; +2, warm; +1, slightly warm; 0, neutral; -1 slightly cool; -2 cool; -3, cold

Source: Fanger (1970 cited by Parsons, 2003)

Appendix B: Detailed Description of Monthly Weather

January

January is the coolest month of the year with the average maximum temperature around 24°C and an average minimum of 14°C. However, records show that temperatures have been reported as high as 32°C and as low as 8°C during the month. It is often cloudy and unsettled as mid-latitude weather disturbances penetrate into the Gulf bringing changeable weather and cool, winter Shamals in their wake. Such Shamals that sweep down the Gulf frequently produce intense convective activity resulting in squally, thundery weather with showers, storms and high seas. On average five or six rain days can be expected during the month, however as many as seventeen rain days have been recorded. Rainfall is often short lived and intense with isolated thunderstorms producing the majority of the recorded rain. Large fluctuations in rainfall occur from year to year with occasional dry years or with as much as 108.8 mm falling during the month. On clear fine days the weather is pleasant and warm with weak afternoon sea breezes. Sea temperatures are around 21°C.

February

Temperatures increase a degree or so in February with mean maximums typically around 25 °C, however the extreme maximum temperature has reached 36°C with a minimum as low as 7°C. Unsettled wintry weather is more frequent, winter Shamals persist with the associated unsettled weather and strong winds. This makes February one of the windiest months with regular Shamals affecting the Gulf. Shamals bring cool, windy and occasionally showery conditions to the southern Gulf. Ahead of an approaching shamal strong Southeasterly winds often develop bringing hot, dry conditions and occasional sandstorms. The transition from Southeasterly winds ahead of the trough to the Northwesterly Shamal is therefore usually associated with a marked fall in temperature. February is the wettest month of the year, with an average of 25mm of rain, it also holds the record for the most rainfall in a day, 150.2 mm in 1988 at Dubai Airport. The expected number of rain days during the month is 5 but has been as high as 12.

The relatively warm, moist air over the Gulf combined with winter weather patterns helps to fuel cloud and storm development. Local convergence and the effect of the mountains in the east of the country also act to generate or enhance rainfall.

March

The period March through to May are the "Spring" months in Dubai when the temperature begins its steady climb towards the summer peaks. Average maximum temperatures rise to around 28°C in March however winter weather patterns continue to affect the area. This combination means that a more abundant supply of energy is available for the development of cloud and storms should the correct combination of meteorological features exist. March is therefore often a very changeable month when Dubai can experience a wide range of weather phenomena. This is why March has the highest expected number of rain days, six on average and up to eighteen in the past as well as the most frequent occurrence of thunderstorms. Average rainfall for the month is 21mm but has been as high as 155 mm. As in February, in between the periods of unsettled weather, winds tend to veer to the Southeast and bring warm, dry desert air to the coast. Temperatures have been recorded in the low 40's °C later in the month however extreme minimum's of 11°C have also been recorded.

April

As the sun begins to climb in the sky, April brings some beautiful weather to the Emirates. Maximum temperatures are typically around 33°C, humidity is generally low and although winter systems are still possible they are becoming a lot less frequent. Expected rainfall is down to around 7 mm falling on three days during the month but in exceptional years rainfall has been as high as 60 mm. The coastal, afternoon sea breeze increases in strength as the temperature gradient between the land and the sea develops. The increase in temperature does however mean that the occasional storms that do develop can be violent with heavy rain and squalls. One particularly violent storm in 1981 produced golf ball sized hail stones and in 2003 a storm and squall produced mean winds of 53 kts gusting to 71 kts. As the month progresses, the high level Jet stream starts to move northwards, cutting off southward incursions of unsettled weather and cool Northwesterly winds to the region. The sea in coastal waters continues to warm up with a mean temperature for the month of about 25°C.

May

May often marks the beginning of the summer heat, average maximum temperatures are between 37 and 38°C, but extremes highs of 47°C have been recorded. The Humidity is however at its lowest level for the year and rain and thunderstorms are extremely rare in coastal areas. Hot, dry Southeasterly winds often prevail in May but comfort levels remain reasonable because of the low humidity. Sea temperatures increase to around 28 to 29 °C.

June

During June, low pressure over Southern Iran, which develops in the lee of the mountains, combines with a ridge of high pressure over Saudi Arabia to produce a northwesterly gradient which can persist over the Gulf for up to six weeks. The phenomena is known locally as the “Forty day Shamal”. From year to year the onset and strength of this effect can vary widely. Hot and generally dry conditions prevail throughout the month with periods of Southeasterly winds replacing the Northwesterly flow when the lee low weakens. When the winds are from the Northwest they bring hot and sometimes dusty conditions from the deserts of Saudi Arabia, Kuwait and Iraq. Temperatures typically reach a maximum of around 39°C but can be as high as 47°C, low humidity at this time helps to keep stress levels reasonably low. Rainfall is infrequent during June with most coastal stations having a completely dry month. Over the mountains in the East of the Emirate summer storms do develop and can cause intense localised heavy rainstorms and flash flooding in the wadi’s . Dry squalls from these storms do occasionally reach the coast dramatically reducing the visibility for a few hours. Sea temperatures increase into the low 30’s°C.

July

As the summer advances and the monsoon spreads northwards over India the lee low effect over southern Iran begins to weaken and pressure gradients become weak over the area. Land and sea breezes begin to dominate the flow and as the sea is still warming up thermal gradients can be strong with a moderate to fresh northwesterly sea breeze most afternoons. The humidity can become extremely high at times producing severe stress. The combination of high temperatures and high humidity can make atmospheric conditions extremely unstable and summer thunderstorms are not uncommon. As in June these usually develop over the mountains in the East of the Emirate where the mountains act as elevated heat sources and where convergence often occurs. Sea breezes on the east coast force very humid air up the mountains where it combines late in the afternoon with Gulf coast sea breezes from the Northwest. Inland stations frequently report Towering Cumulus and Cumulonimbus with thunderstorms, squalls and dust or sandstorms. Mid and upper level easterly winds then help to propagate the storms towards the Gulf coast where they can occasionally affect Dubai, Sharjah and the northern Emirates. Mean maximum temperatures in July are typically around 41°C,Inland Stations being the hottest with expected maximums of 44°C and all time extremes around 49°C. Sea temperatures begin to become unpleasantly warm reaching 32-33°C.

August

Conditions during August are similar to those experienced in July in terms of temperature and humidity. During the summer as the sea surface temperature rises, the Gulf increasingly becomes a prolific source of water vapour. Afternoon sea breezes bring this warm, humid air to coastal areas and can produce some of the years most uncomfortable conditions. The risk of summer storms persists and although most frequent over the mountains can occasionally affect coastal areas. Inland desert areas, have a rather different climate, although summer maximum temperatures in the desert are frequently higher than those on the coast the mean humidity is up to 20% lower than coastal areas. This produces rather more comfortable conditions and is the reason that, prior to the prevalence of air conditioning, many local families would spend the summer months away from the coast. Mean sea temperatures are around 33°C but have been recorded as high as 35°C.

September

As temperatures begin to fall after the height of the summer there is a sting in the tail for residents of coastal cities. Sea temperatures reach a peak at the end of August and it is therefore during this time that the potential for warm, humid air to be advected to the coast reaches a maximum. September is far from being the most humid month but it has the highest humidity of the hot summer months. For this reason September is extremely humid and is one of the months with a high occurrence of fog. Night time temperatures begin to drop into the upper 20’s °C and fog will often form in the early morning hours. Maximum temperatures can still occasionally reach extremes of 45°C with extreme minimum’s around 22°C. Sea temperatures begin to fall later in the month with the mean for the month of around 32°C.

October

It is the latter part of the year when the weather is the most pleasant and settled in the UAE. Maximum temperatures in October are around 35°C and although the humidity remains reasonably high comfort indices have fallen from the extreme levels experienced in the summer. As night time temperatures continue to fall, faster than the sea temperature, fog is still a problem in the early morning hours. The weather is usually dry and settled but there have been exceptional years such as 1997 when several weather systems penetrated into the area bringing unsettled wet weather and thunderstorms. The mean sea temperature for the month is 30°C.

November

Temperatures continue to fall sharply during the month with mean maximums between 30°C and 31°C. As the subtropical jet moves southwards and upper level winds over the Gulf strengthen there is the increased potential for low pressure systems to propagate from the North and West into the area. Late in the month it is possible for the first Shamals to affect the Gulf but it is not usually until December that unsettled weather reaches the region. Again November 1997 was an exceptional year with twelve rain days including four thunderstorm days producing 31 mm of rain at Dubai International Airport. In 2004 a severe line squall and thunderstorm brought heavy rain (24 mm) and a hail storm that produced stones of up to 1.5 cm in diameter.

December

By the end of the year winter systems are more frequently affecting the Emirates, the mean monthly rainfall is 15 mm with rain reported on three or four days during the month. Mean maximums have fallen to 26°C with minimum's typically around 16°C. The humidity is frequently high in the early morning hours with fog still causing a problem, although Dubai and the Northern Emirates tend to be a little less humid than other areas of the country. Occasionally persistent periods of unsettled and wet weather can affect Dubai in December. Rainfall totals have been as high as 130 mm with a 24 hour maximum rainfall of 73 mm. Sea temperatures fall to around 23°C.

Source: Dubai Meteorological Office [Online], 2009

Appendix C: Meteorological Data for the Survey Periods
Source: Dubai Meteorological Office, Dubai International Airport

Appendix C.1 Sunshine Hours and Radiation Levels for September, October, November & January

DATE	SEPTEMBER 2008		OCTOBER 2008		NOVEMBER 2008		JANUARY 2009	
	SUN-SHINE (hours)	RADIATION ($mWcm^{-2}$)	SUN-SHINE (hours)	RADIATION ($mWcm^{-2}$)	SUN-SHINE (hours)	RADIATION ($mWcm^{-2}$)	SUN-SHINE (hours)	RADIATION ($mWcm^{-2}$)
1	9.9	481.5	9.8	452.7	9.0	352.7	8.4	382.4
2	10.6	499.8	9.9	460.1	8.9	360.7	8.7	388.8
3	10.7	539.5	9.8	461.9	8.8	369.4	8.6	376.1
4	10.6	544.3	9.6	442.9	9.2	394.7	8.2	363.8
5	10.7	543.5	9.4	429.8	9.3	478.0	8.7	396.1
6	10.5	523.6	9.6	450.1	8.9	432.9	8.2	375.3
7	10.2	487.0	9.6	466.9	9.3	479.9	8.7	410.0
8	10.3	507.2	9.6	455.2	9.2	468.6	8.1	307.7
9	10.3	496.9	9.5	441.6	9.0	417.1	8.7	400.8
10	10.2	494.6	9.5	430.0	9.1	432.6	8.7	393.9
11	10.2	493.7	9.5	429.9	9.2	450.0	8.4	352.5
12	10.2	463.0	9.4	420.5	9.1	452.9	5.7	199.8
13	10.0	469.6	9.4	436.6	9.0	422.0	7.2	241.2
14	10.1	480.9	9.5	435.2	9.0	431.8	7.0	304.6
15	10.2	493.6	9.3	399.1	8.0	372.4	7.9	333.4
16	9.5	461.2	9.2	408.9	8.1	396.7	7.6	277.7
17	10.0	492.6	9.4	415.2	9.1	419.4	9.0	426.1
18	9.5	367.4	9.3	415.6	9.2	439.8	8.3	358.3
19	9.4	392.8	9.3	414.3	9.1	452.9	6.3	181.0
20	9.7	421.9	9.4	416.6	9.0	470.7	8.8	446.9
21	10.0	471.5	9.4	414.2	8.9	444.5	9.2	416.8
22	9.9	448.1	8.7	377.4	9.1	438.8	9.1	428.1
23	10.0	472.8	9.2	386.9	6.0	302.2	8.2	348.1
24	9.9	454.5	9.3	410.4	9.0	433.4	8.3	342.7
25	10.0	466.1	9.3	412.9	8.9	410.4	8.8	461.2
26	10.1	470.8	9.1	389.8	8.7	391.4	9.3	467.7
27	10.1	481.8	9.1	393.6	8.6	391.6	9.3	467.4
28	9.5	465.6	9.2	379.4	8.8	397.3	9.1	438.6
29	10.1	468.0	9.3	383.7	7.8	243.2	7.7	400.5
30	9.9	453.8	9.2	402.3	8.8	398.6	9.2	485.0
31			9.3	399.4			9.3	469.2

Appendix C.2: Hourly Wind Speed, Temperature and Relative Humidity Data

Source: Dubai Meteorological Office, Dubai International Airport

General Information:

Location: Dubai International Airport
Hourly Data
Long: 55 deg 20 min E
Station No.: 41194
Lat: 25 deg 15 min N
Time: GMT (Local Time = GMT+4 Hours)
Height: 8 meters

Date: 24 September 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction (deg)	Speed (kts)	Speed (m/s)	Dry Bulb (c°)	Dew Point (c°)	Wet Bulb (c°)	Vapour Pressure (mb)	(%)
24	0000	150	4	2.06	28.8	23.6	25.0	29.9	73
24	0100	150	4	2.06	28.5	23.3	24.7	29.3	73
24	0200	110	5	2.57	28.1	22.9	24.3	28.6	73
24	0300	150	4	2.06	28.3	23.1	24.5	29.0	73
24	0400	120	4	2.06	29.7	23.3	25.0	29.3	68
24	0500	050	5	2.57	31.2	25.0	26.6	32.5	69
24	0600	070	5	2.57	33.0	23.0	25.7	28.8	55
24	0700	100	6	3.09	34.8	22.1	25.6	27.3	47
24	0800	180	3	1.54	36.6	21.9	25.9	27.0	42
24	0900	330	11	5.66	35.8	24.4	27.3	31.3	51
24	1000	330	12	6.17	35.3	24.2	27.0	31.0	52
24	1100	310	13	6.69	33.9	24.7	27.0	31.9	58
24	1200	340	11	5.66	33.4	24.8	26.9	32.1	60
24	1300	340	11	5.66	32.9	25.4	27.2	33.3	64
24	1400	330	9	4.63	32.2	25.4	27.1	33.5	67
24	1500	360	7	3.60	31.8	25.3	26.9	33.2	68
24	1600	360	4	2.06	32.1	24.6	26.5	31.8	64
24	1700	060	5	2.57	32.2	24.4	26.4	31.4	63
24	1800	080	7	3.60	31.9	25.6	27.2	33.9	69
24	1900	080	8	4.12	31.5	26.4	27.6	35.5	74
24	2000	080	7	3.60	31.3	26.2	27.5	35.1	74
24	2100	110	6	3.09	31.0	25.0	26.5	32.6	70
24	2200	200	5	2.57	30.3	25.3	26.5	33.1	74
24	2300	230	3	1.54	30.0	24.8	26.1	32.0	73

Date: 25 September 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction (deg)	Speed (kts)	Speed (m/s)	Dry Bulb (c°)	Dew Point (c°)	Wet Bulb (c°)	Vapour Pressure (mb)	(%)
25	0000	310	4	2.06	30.2	24.3	25.8	31.1	70
25	0100	340	4	2.06	30.4	23.7	25.5	30.1	67
25	0200	080	4	2.06	29.4	23.7	25.2	30.1	71
25	0300	050	5	2.57	29.5	23.4	25.0	29.4	69
25	0400	060	7	3.60	31.1	23.6	25.6	30.0	64
25	0500	090	8	4.12	31.8	25.3	26.9	33.2	68
25	0600	080	3	1.54	35.2	19.1	23.9	22.5	38
25	0700	180	6	3.09	36.4	15.4	22.3	17.8	28
25	0800	240	5	2.57	38.0	15.0	22.6	17.4	25
25	0900	320	10	5.14	38.0	19.8	25.0	23.6	34
25	1000	330	11	5.66	36.7	23.2	26.7	29.1	45
25	1100	330	12	6.17	35.8	22.3	25.9	27.6	45
25	1200	340	12	6.17	34.8	23.4	26.4	29.6	51
25	1300	340	12	6.17	34.5	23.5	26.4	29.6	52
25	1400	360	11	5.66	34.7	21.0	24.8	25.4	44
25	1500	040	8	4.12	34.3	20.2	24.3	24.2	43
25	1600	050	7	3.60	34.1	18.1	23.0	21.2	38
25	1700	060	8	4.12	33.5	19.5	23.7	23.1	43
25	1800	060	7	3.60	33.5	18.0	22.8	21.0	39
25	1900	070	8	4.12	33.2	18.1	22.8	21.2	40
25	2000	100	8	4.12	32.9	18.6	23.0	21.8	42
25	2100	100	8	4.12	31.8	18.3	22.5	21.5	44
25	2200	100	6	3.09	32.7	16.4	21.7	19.0	37
25	2300	030	2	1.03	32.3	17.3	22.1	20.1	40

Date: 26 September 2008

DATE	TIME	WIND Direction (deg)	WIND Speed (kts)	WIND Speed (m/s)	TEMPERATURES Dry Bulb (c°)	TEMPERATURES Dew Point (c°)	TEMPERATURES Wet Bulb (c°)	TEMPERATURES Vapour Pressure (mb)	Relative Humidity (%)
26	0000	130	5	2.57	31.9	16.5	21.5	19.1	39
26	0100	150	4	2.06	30.7	15.4	20.6	17.8	39
26	0200	160	3	1.54	31.3	12.5	19.3	14.7	31
26	0300	140	6	3.09	31.1	9.7	18.1	12.2	26
26	0400	150	6	3.09	31.7	9.6	18.2	12.1	25
26	0500	180	6	3.09	33.6	11.3	19.5	13.5	25
26	0600	170	10	5.14	36.0	12.1	20.6	14.3	23
26	0700	190	9	4.63	38.4	11.2	21.0	13.5	19
26	0800	230	8	4.12	40.2	9.2	20.8	11.8	15
26	0900	300	11	5.66	39.3	14.9	22.9	17.2	23
26	1000	310	11	5.66	38.6	16.1	23.3	18.7	26
26	1100	320	11	5.66	37.7	15.9	22.9	18.4	27
26	1200	310	13	6.69	35.6	20.3	24.7	24.3	40
26	1300	320	12	6.17	34.1	23.4	26.2	29.5	53
26	1400	340	7	3.60	33.1	23.1	25.8	28.9	55
26	1500	340	6	3.09	32.7	22.4	25.2	27.8	54
26	1600	010	4	2.06	32.6	22.0	24.9	27.1	53
26	1700	060	6	3.09	32.5	22.5	25.2	27.9	55
26	1800	070	8	4.12	31.9	23.1	25.4	28.9	59
26	1900	080	8	4.12	31.3	22.0	24.6	27.0	57
26	2000	110	4	2.06	31.2	21.0	23.9	25.4	54
26	2100	020	2	1.03	30.9	21.3	24.0	25.9	56
26	2200	180	5	2.57	30.5	21.8	24.2	26.7	59
26	2300	350	4	2.06	30.7	19.9	23.1	23.8	52

Date: 01 October 2008

DATE	TIME	WIND Direction (deg)	Speed (kts)	Speed (m/s)	TEMPERATURES Dry Bulb (c°)	Dew Point (c°)	Wet Bulb (c°)	Vapour Pressure (mb)	Relative Humidity (%)
1	0000	080	4	2.06	29.6	25.2	26.3	33.0	77
1	0100	100	4	2.06	29.0	24.7	25.8	31.9	77
1	0200	080	5	2.57	28.8	24.5	25.6	31.5	77
1	0300	050	4	2.06	28.9	24.1	25.4	30.9	75
1	0400	110	3	1.54	30.4	24.4	26.0	31.5	70
1	0500	040	5	2.57	32.5	21.3	24.5	25.9	51
1	0600	040	8	4.12	35.2	17.3	22.9	20.2	34
1	0700	080	2	1.03	37.5	16.3	23.1	18.9	28
1	0800	310	9	4.63	36.5	18.9	24.2	22.4	35
1	0900	320	10	5.14	36.1	18.6	23.9	21.9	35
1	1000	310	13	6.69	36.3	16.9	23.0	19.6	31
1	1100	310	14	7.20	35.9	18.0	23.5	21.0	34
1	1200	340	12	6.17	35.0	19.3	24.0	22.9	39
1	1300	340	11	5.66	34.2	19.4	23.8	23.0	41
1	1400	330	10	5.14	32.9	22.3	25.2	27.6	53
1	1500	340	8	4.12	32.4	23.6	25.9	29.8	59
1	1600	330	7	3.60	32.1	23.8	26.0	30.3	61
1	1700	030	4	2.06	32.4	22.7	25.3	28.3	56
1	1800	080	5	2.57	31.7	24.0	26.0	30.6	63
1	1900	080	5	2.57	31.3	23.3	25.5	29.4	62
1	2000	070	4	2.06	31.2	23.0	25.2	28.7	61
1	2100	050	4	2.06	31.2	22.2	24.7	27.3	58
1	2200	050	4	2.06	30.8	23.4	25.4	29.4	64
1	2300	360	4	2.06	30.5	23.8	25.6	30.3	67

Date: 18 November 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
18	0000	210	4	2.06	22.1	14.1	17.1	16.3	60
18	0100	200	5	2.57	21.4	13.2	16.3	15.4	59
18	0200	230	2	1.03	20.9	13.2	16.2	15.4	61
18	0300	170	4	2.06	21.0	13.3	16.3	15.5	61
18	0400	140	3	1.54	22.0	13.5	16.7	15.7	58
18	0500	190	5	2.57	24.0	14.3	17.8	16.5	54
18	0600	180	4	2.06	26.4	11.9	17.5	14.2	40
18	0700	060	4	2.06	27.3	12.0	17.8	14.2	38
18	0800	260	6	3.09	27.1	13.3	18.4	15.5	42
18	0900	260	9	4.63	27.3	13.9	18.7	16.1	43
18	1000	300	11	5.66	27.0	12.9	18.1	15.1	41
18	1100	300	9	4.63	27.4	12.5	18.1	14.7	39
18	1200	310	9	4.63	27.0	11.3	17.4	13.6	37
18	1300	320	7	3.60	26.4	11.6	17.3	13.8	39
18	1400	320	7	3.60	25.9	10.3	16.6	12.7	37
18	1500	320	6	3.09	25.8	10.6	16.6	13.0	38
18	1600	320	4	2.06	25.6	11.9	17.2	14.2	42
18	1700	340	2	1.03	25.3	13.0	17.6	15.3	46
18	1800	320	6	3.09	25.2	13.3	17.7	15.5	47
18	1900	140	3	1.54	24.5	12.0	16.8	14.2	45
18	2000	080	5	2.57	23.6	12.1	16.6	14.3	48
18	2100	110	6	3.09	21.2	11.4	15.3	13.7	53
18	2200	110	5	2.57	20.9	12.2	15.6	14.4	57
18	2300	120	5	2.57	20.9	12.7	15.9	14.9	59

Date: 19 November 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
19	0000	120	5	2.57	20.8	13.1	16.1	15.3	61
19	0100	130	4	2.06	20.2	12.8	15.7	15.0	62
19	0200	110	6	3.09	19.6	12.9	15.5	15.1	65
19	0300	100	5	2.57	19.9	13.0	15.7	15.2	64
19	0400	100	4	2.06	21.3	13.3	16.4	15.5	60
19	0500	090	6	3.09	24.1	12.6	17.0	14.8	48
19	0600	080	6	3.09	25.7	12.7	17.6	14.9	44
19	0700	050	8	4.12	26.9	10.0	16.8	12.4	34
19	0800	050	7	3.60	28.3	8.3	16.6	11.1	28
19	0900	350	11	5.66	28.7	7.0	16.2	10.2	25
19	1000	350	12	6.17	27.9	13.7	18.8	15.9	41
19	1100	350	12	6.17	27.6	13.0	18.4	15.2	40
19	1200	360	12	6.17	27.5	12.9	18.3	15.1	40
19	1300	360	11	5.66	27.0	12.1	17.8	14.3	39
19	1400	010	10	5.14	26.7	11.8	17.5	14.1	39
19	1500	030	8	4.12	26.4	12.3	17.7	14.5	41
19	1600	050	8	4.12	26.0	11.9	17.4	14.2	41
19	1700	050	8	4.12	25.2	10.5	16.4	12.9	39
19	1800	060	8	4.12	24.1	9.1	15.4	11.7	38
19	1900	070	8	4.12	23.1	8.2	14.6	11.0	38
19	2000	070	8	4.12	22.4	8.7	14.5	11.4	41
19	2100	070	8	4.12	21.9	8.2	14.1	11.0	41
19	2200	050	5	2.57	22.1	8.0	14.1	10.9	40
19	2300	050	5	2.57	21.7	7.7	13.8	10.6	40

Date: 20 November 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
20	0000	040	5	2.57	20.6	7.7	13.4	10.7	43
20	0100	050	3	1.54	19.4	7.6	12.9	10.6	46
20	0200	070	7	3.60	20.5	8.3	13.6	11.1	45
20	0300	060	8	4.12	19.3	9.0	13.5	11.7	51
20	0400	070	6	3.09	21.2	9.6	14.5	12.1	47
20	0500	080	6	3.09	23.6	10.5	15.8	12.9	43
20	0600	090	8	4.12	27.0	7.2	15.7	10.3	28
20	0700	100	10	5.14	29.1	1.9	14.7	7.1	17
20	0800	120	9	4.63	30.2	1.0	14.9	6.7	15
20	0900	120	5	2.57	30.9	0.7	15.0	6.5	14
20	1000	350	12	6.17	31.4	11.6	19.0	13.8	29
20	1100	360	14	7.20	29.3	13.8	19.4	16.0	38
20	1200	360	11	5.66	28.5	14.2	19.3	16.5	41
20	1300	360	9	4.63	27.9	13.7	18.8	15.9	41
20	1400	020	6	3.09	27.0	13.2	18.3	15.4	42
20	1500	050	7	3.60	26.5	12.8	17.9	15.0	42
20	1600	040	6	3.09	25.6	14.6	18.6	16.9	50
20	1700	060	6	3.09	24.9	15.4	18.8	17.8	55
20	1800	060	6	3.09	24.1	15.5	18.5	17.9	58
20	1900	060	5	2.57	23.6	15.3	18.2	17.6	59
20	2000	090	6	3.09	22.6	14.6	17.5	16.9	60
20	2100	110	6	3.09	22.0	12.1	16.0	14.3	53
20	2200	090	4	2.06	22.0	10.0	15.0	12.4	46
20	2300	200	4	2.06	21.7	10.7	15.2	13.0	49

Date: 21 November 2008

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
21	0000	220	3	1.54	20.5	11.5	15.2	13.8	56
21	0100	250	2	1.03	19.7	12.3	15.0	14.5	62
21	0200	190	2	1.03	20.1	11.9	15.2	14.2	59
21	0300	190	4	2.06	20.2	11.8	15.2	14.0	58
21	0400	140	3	1.54	19.7	11.6	14.9	13.8	59
21	0500	190	5	2.57	22.1	11.0	15.5	13.3	49
21	0600	180	6	3.09	24.3	10.0	15.9	12.5	40
21	0700	210	5	2.57	27.0	10.1	16.8	12.5	34
21	0800	290	2	1.03	28.9	11.3	18.1	13.6	33
21	0900	310	7	3.60	29.0	13.5	19.1	15.7	38
21	1000	290	7	3.60	29.2	11.1	18.1	13.4	32
21	1100	290	9	4.63	28.8	11.7	18.2	13.9	34
21	1200	300	10	5.14	28.1	15.6	19.9	18.0	46
21	1300	310	10	5.14	27.0	17.4	20.5	20.2	55
21	1400	330	9	4.63	26.4	17.1	20.2	19.8	56
21	1500	320	7	3.60	26.5	14.8	18.9	17.1	48
21	1600	320	4	2.06	26.0	15.6	19.2	18.0	52
21	1700	300	3	1.54	25.8	15.4	19.0	17.8	52
21	1800	340	3	1.54	24.2	15.6	18.6	18.0	58
21	1900	090	6	3.09	23.3	15.2	18.1	17.6	60
21	2000	090	6	3.09	22.9	14.6	17.6	16.9	59
21	2100	090	5	2.57	22.9	13.8	17.2	16.0	56
21	2200	090	4	2.06	22.3	13.0	16.5	15.2	55
21	2300	090	5	2.57	21.9	12.6	16.2	14.8	55

Date: 20 January 2009

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
20	0000	110	3	1.54	14.6	10.1	12.0	12.5	74
20	0100	110	5	2.57	13.6	9.7	11.4	12.2	77
20	0200	120	4	2.06	14.0	9.5	11.5	12.0	74
20	0300	100	5	2.57	13.7	9.4	11.3	11.9	75
20	0400	090	4	2.06	13.8	9.5	11.4	12.0	75
20	0500	180	4	2.06	16.0	9.3	12.2	11.8	64
20	0600	110	4	2.06	17.9	8.6	12.7	11.3	54
20	0700	090	4	2.06	19.5	7.4	12.8	10.4	45
20	0800	070	3	1.54	20.4	7.5	13.3	10.5	43
20	0900	310	9	4.63	20.5	8.0	13.5	10.8	44
20	1000	310	8	4.12	20.5	8.0	13.5	10.8	44
20	1100	290	6	3.09	20.5	7.6	13.3	10.6	43
20	1200	310	8	4.12	20.4	8.2	13.5	11.0	45
20	1300	310	10	5.14	19.8	8.3	13.3	11.1	47
20	1400	320	8	4.12	18.9	7.8	12.7	10.7	48
20	1500	310	6	3.09	18.6	8.9	13.1	11.6	53
20	1600	330	6	3.09	18.4	9.3	13.2	11.9	55
20	1700	320	6	3.09	18.3	10.5	13.8	12.9	60
20	1800	320	4	2.06	18.2	10.4	13.7	12.8	60
20	1900	340	4	2.06	18.2	10.4	13.7	12.8	60
20	2000	130	4	2.06	16.9	9.7	12.8	12.2	62
20	2100	210	4	2.06	16.6	9.8	12.8	12.3	64
20	2200	180	3	1.54	15.7	9.9	12.4	12.3	68
20	2300	170	3	1.54	14.9	9.3	11.8	11.9	69

Date: 21 January 2009

DATE	TIME	WIND Direction (deg)	WIND Speed (kts)	WIND Speed (m/s)	TEMPERATURES Dry Bulb (c°)	TEMPERATURES Dew Point (c°)	TEMPERATURES Wet Bulb (c°)	TEMPERATURES Vapour Pressure (mb)	Relative Humidity (%)
21	0000	150	4	2.06	14.7	9.3	11.7	11.9	70
21	0100	120	4	2.06	13.7	9.0	11.1	11.6	73
21	0200	170	3	1.54	14.0	9.3	11.4	11.9	73
21	0300	180	3	1.54	13.7	9.2	11.2	11.8	74
21	0400	170	4	2.06	14.2	9.3	11.5	11.9	72
21	0500	180	4	2.06	16.9	10.1	13.0	12.6	64
21	0600	190	4	2.06	18.7	9.8	13.6	12.3	56
21	0700	070	3	1.54	20.7	9.7	14.4	12.2	49
21	0800	300	7	3.60	20.5	9.6	14.2	12.1	49
21	0900	290	8	4.12	20.6	9.6	14.3	12.2	49
21	1000	290	11	5.66	20.5	10.7	14.7	13.1	53
21	1100	300	12	6.17	20.7	10.9	14.9	13.2	53
21	1200	290	12	6.17	20.7	10.6	14.8	13.0	52
21	1300	280	9	4.63	20.2	10.2	14.4	12.6	52
21	1400	300	6	3.09	19.5	10.3	14.2	12.7	55
21	1500	300	7	3.60	19.2	9.8	13.8	12.3	54
21	1600	280	5	2.57	19.1	10.0	13.8	12.4	55
21	1700	270	6	3.09	19.0	10.1	13.9	12.6	56
21	1800	240	5	2.57	19.2	10.6	14.2	12.9	57
21	1900	210	4	2.06	18.0	10.7	13.8	13.0	62
21	2000	200	6	3.09	17.4	11.3	13.8	13.6	67
21	2100	200	7	3.60	16.3	11.3	13.4	13.6	72
21	2200	200	6	3.09	16.1	11.3	13.3	13.6	73
21	2300	200	5	2.57	15.7	11.1	13.1	13.4	74

Date: 22 January 2009

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
22	0000	190	6	3.09	16.0	10.8	13.0	13.1	71
22	0100	160	5	2.57	14.4	10.5	12.2	12.8	77
22	0200	170	4	2.06	14.2	10.5	12.1	12.8	78
22	0300	170	4	2.06	14.0	9.9	11.7	12.3	76
22	0400	170	5	2.57	14.1	9.6	11.6	12.1	74
22	0500	170	5	2.57	15.1	9.5	12.0	12.0	69
22	0600	190	7	3.60	17.5	9.5	13.0	12.0	59
22	0700	220	7	3.60	19.8	9.5	13.9	12.0	51
22	0800	270	9	4.63	20.3	7.1	13.0	10.2	42
22	0900	270	9	4.63	20.8	6.9	13.1	10.0	40
22	1000	290	8	4.12	21.0	7.8	13.6	10.7	42
22	1100	260	10	5.14	21.0	8.4	13.9	11.2	44
22	1200	270	8	4.12	20.7	8.8	13.9	11.5	46
22	1300	270	10	5.14	20.4	9.2	14.0	11.8	48
22	1400	270	9	4.63	19.8	8.6	13.5	11.3	48
22	1500	260	8	4.12	19.6	7.5	12.9	10.5	45
22	1600	270	9	4.63	19.4	8.8	13.4	11.5	50
22	1700	250	6	3.09	19.2	8.3	13.1	11.1	49
22	1800	240	5	2.57	19.1	9.4	13.6	12.0	53
22	1900	190	6	3.09	17.4	9.1	12.7	11.7	58
22	2000	190	7	3.60	16.3	9.3	12.4	11.9	63
22	2100	200	7	3.60	16.1	10.0	12.7	12.5	67
22	2200	200	8	4.12	15.9	10.3	12.7	12.7	69
22	2300	190	7	3.60	16.1	10.7	13.0	13.0	70

Date: 23 January 2009

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
23	0000	190	6	3.09	15.6	10.8	12.9	13.2	73
23	0100	190	8	4.12	15.1	10.8	12.6	13.1	75
23	0200	190	7	3.60	15.7	10.9	12.9	13.2	73
23	0300	190	7	3.60	15.0	10.3	12.3	12.7	73
23	0400	180	8	4.12	13.7	9.4	11.3	11.9	75
23	0500	180	9	4.63	14.7	9.5	11.8	12.1	71
23	0600	180	9	4.63	15.9	9.4	12.3	11.9	65
23	0700	180	9	4.63	18.1	9.5	13.2	12.1	57
23	0800	200	8	4.12	19.8	9.5	13.9	12.0	51
23	0900	240	6	3.09	21.3	8.0	13.8	10.9	42
23	1000	260	12	6.17	20.7	9.1	14.1	11.7	47
23	1100	250	13	6.69	20.1	8.3	13.4	11.1	46
23	1200	250	15	7.72	20.0	10.8	14.6	13.1	55
23	1300	260	14	7.20	19.7	8.2	13.2	11.0	47
23	1400	290	18	9.26	17.8	9.8	13.2	12.3	59
23	1500	270	18	9.26	15.1	10.1	12.3	12.6	72
23	1600	270	8	4.12	15.1	10.8	12.6	13.1	75
23	1700	190	7	3.60	15.5	10.9	12.9	13.3	74
23	1800	210	6	3.09	14.7	9.5	11.7	11.9	70
23	1900	210	6	3.09	12.9	8.0	10.3	10.9	72
23	2000	180	6	3.09	13.5	9.6	11.3	12.1	77
23	2100	190	6	3.09	13.4	9.7	11.4	12.3	79
23	2200	180	8	4.12	13.3	9.8	11.3	12.3	78
23	2300	320	18	9.26	11.9	6.8	9.3	10.0	70

Date: 24 January 2009

DATE	TIME	WIND			TEMPERATURES				Relative Humidity
		Direction	Speed	Speed	Dry Bulb	Dew Point	Wet Bulb	Vapour Pressure	
		(deg)	(kts)	(m/s)	(c°)	(c°)	(c°)	(mb)	(%)
24	0000	090	4	2.06	11.2	7.3	9.2	10.4	77
24	0100	170	5	2.57	12.4	7.3	9.7	10.4	71
24	0200	170	9	4.63	12.2	7.9	9.8	10.7	74
24	0300	170	6	3.09	12.1	7.8	9.8	10.7	75
24	0400	170	12	6.17	12.1	8.0	9.9	10.9	76
24	0500	180	8	4.12	13.4	8.9	10.9	11.6	74
24	0600	180	8	4.12	14.7	8.7	11.4	11.4	67
24	0700	150	4	2.06	15.6	9.3	12.1	11.9	66
24	0800	150	8	4.12	17.0	9.5	12.8	12.0	61
24	0900	280	11	5.66	18.4	6.0	11.8	9.5	44
24	1000	280	12	6.17	19.3	6.5	12.4	9.8	43
24	1100	300	12	6.17	19.0	7.2	12.5	10.3	46
24	1200	280	12	6.17	19.0	6.9	12.4	10.1	45
24	1300	270	11	5.66	18.9	5.5	11.8	9.1	41
24	1400	300	8	4.12	18.2	6.8	12.0	10.0	47
24	1500	260	8	4.12	18.1	8.2	12.6	11.0	52
24	1600	270	9	4.63	18.2	7.4	12.3	10.4	49
24	1700	290	8	4.12	17.8	7.9	12.3	10.8	52
24	1800	300	6	3.09	17.3	8.0	12.2	10.9	54
24	1900	260	6	3.09	18.0	7.8	12.4	10.7	51
24	2000	180	5	2.57	15.4	8.9	11.8	11.6	65
24	2100	190	7	3.60	14.3	8.7	11.2	11.4	69
24	2200	180	3	1.54	13.9	8.8	11.1	11.4	71
24	2300	150	4	2.06	13.3	8.4	10.6	11.2	72

Appendix D: Summary of the Sample Population

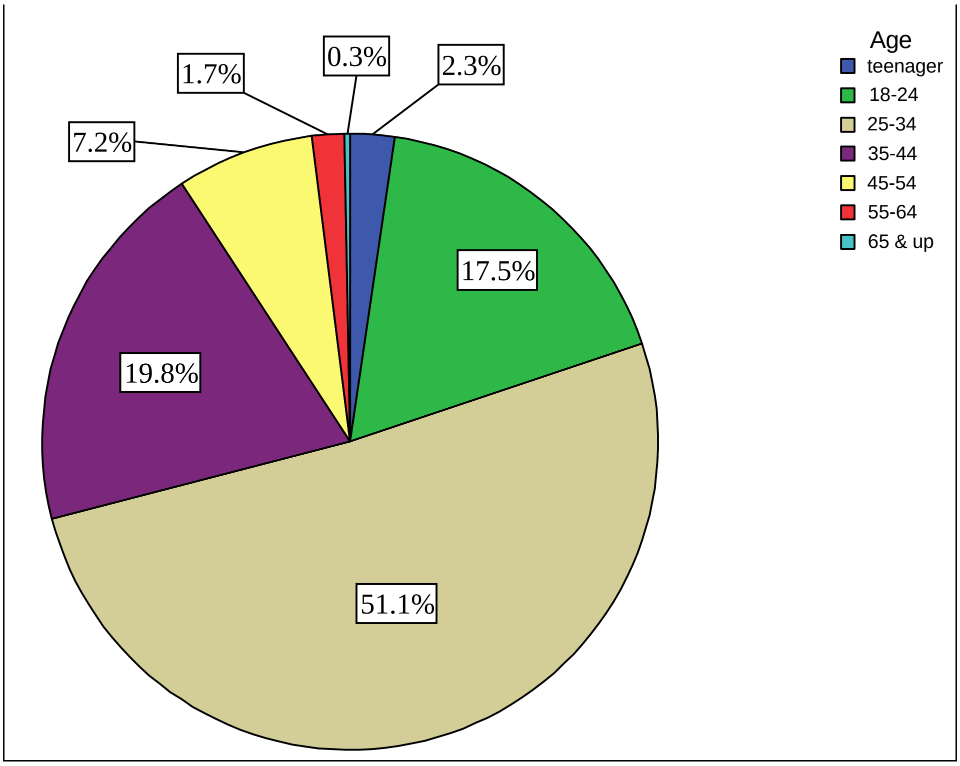


Figure D.1: Distribution by Age

Table D.1: Distribution by Activity

	Current Activity	
	Count	%
sitting	219	(31.5%)
standin g	424	(60.9%)
walking	53	(7.6%)

Table D.2: Distribution by Occupation

	Occupation	
	Count	%
pupil	25	(3.6%)
working person	630	(90.8%)
housekeeper	2	(.3%)
tourist	31	(4.5%)
52	2	(.3%)
55	2	(.3%)
56	1	(.1%)
60	1	(.1%)

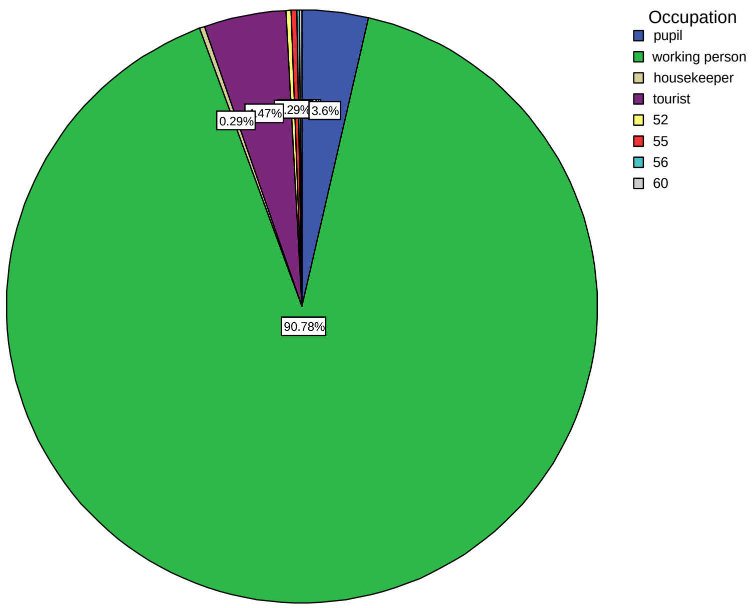


Figure D.2: Distribution by Occupation

Table D.3: Distribution by Nationality

	Origin Country	
	Count	%
Africa	1	(.1%)
Algeria	1	(.1%)
Australia	3	(.4%)
Bangladesh	17	(2.4%)
Brazil	1	(.1%)
Canada	2	(.3%)
China	1	(.1%)
Croatia	1	(.1%)
Denmark	1	(.1%)
Dhaka	1	(.1%)
Egypt	17	(2.4%)
England	1	(.1%)
Ethiopia	4	(.6%)
France	3	(.4%)
Georgia	1	(.1%)
Germany	2	(.3%)
Holland	1	(.1%)
India	230	(33.0%)
Indonesia	2	(.3%)
Iran	3	(.4%)
Iraq	1	(.1%)
Islamabad	1	(.1%)
Jordan	6	(.9%)
Kenya	12	(1.7%)
Kerala	1	(.1%)
Kuwait	1	(.1%)
Lebanon	8	(1.1%)
Malaysia	2	(.3%)
Morocco	3	(.4%)
Mumbai	2	(.3%)
Myanmar	3	(.4%)
Nepal	15	(2.2%)
Oman	6	(.9%)
Pakista	2	(.3%)
Pakistan	44	(6.3%)
Palestine	3	(.4%)
Philippines	158	(22.7%)
Phils	69	(9.9%)
Russia	5	(.7%)
Saudi Arabia	1	(.1%)
South Africa	4	(.6%)
Sri Lanka	17	(2.4%)
Sudan	6	(.9%)
Syria	6	(.9%)
Tanzania	1	(.1%)
Thailand	1	(.1%)
Tunisia	5	(.7%)
Turkey	2	(.3%)
UAE	8	(1.1%)
UK	3	(.4%)
United Kingdom	1	(.1%)
USA	2	(.3%)
Yemen	1	(.1%)
Zanzibar	1	(.1%)
Zimbabwe	1	(.1%)

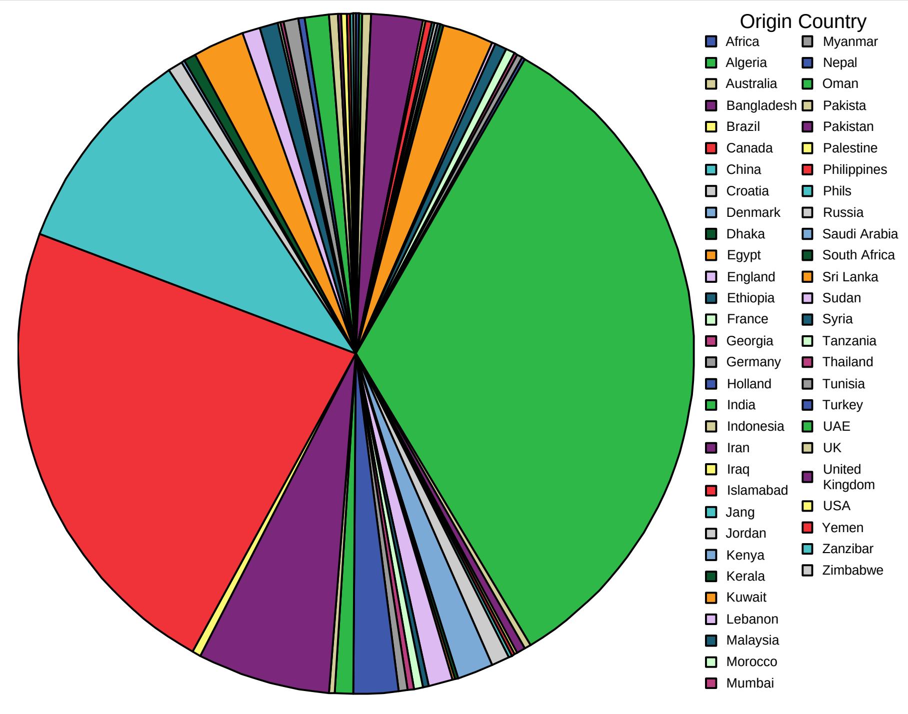


Figure D.3: Distribution by Nationality

Appendix E: Environmental Readings During the Survey

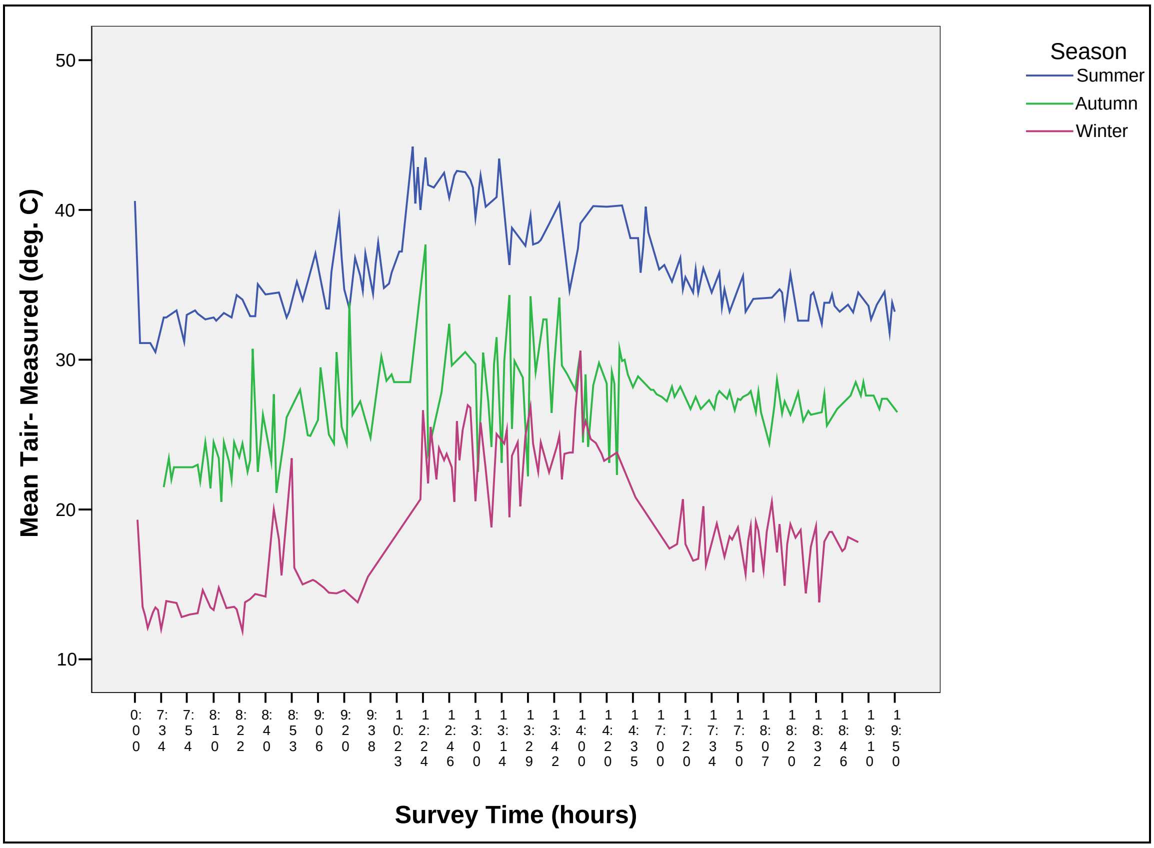


Figure E.1: Air Temperatures Measured Per Season

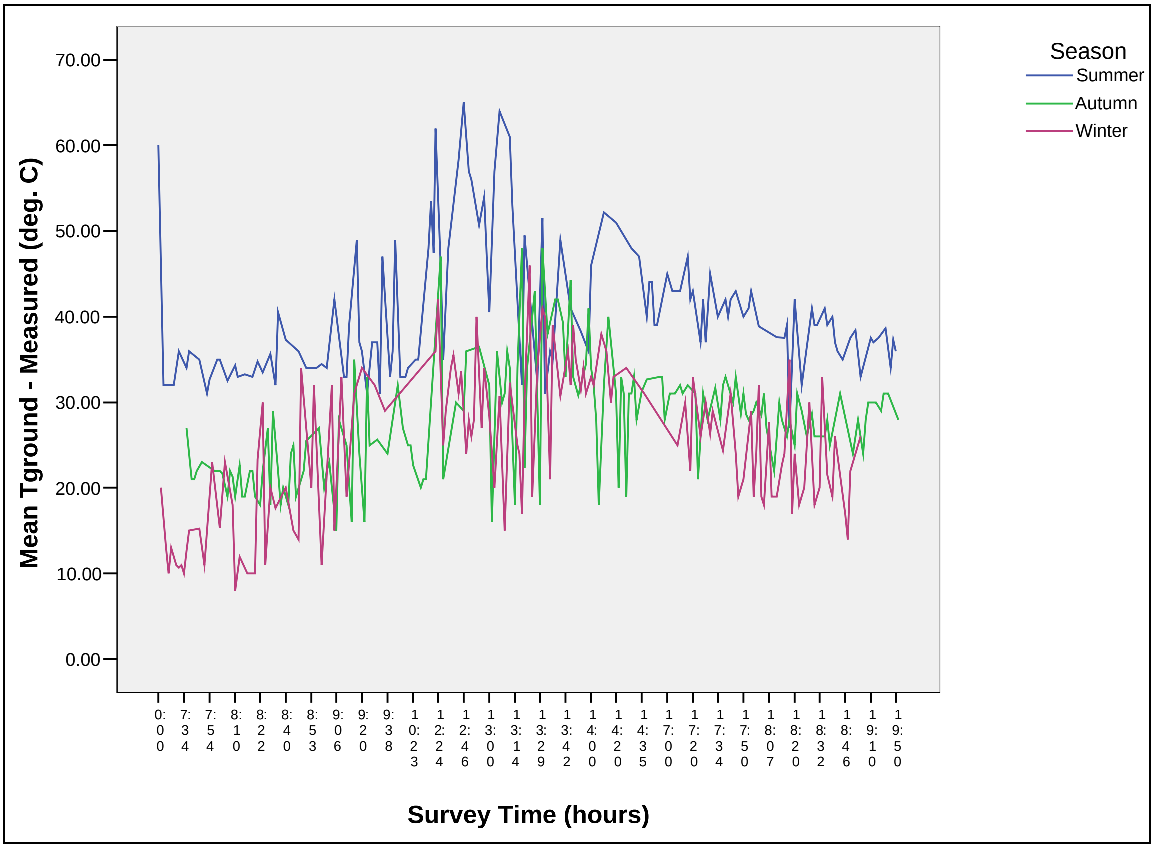


Figure E.2: Ground Temperatures Measured Per Season

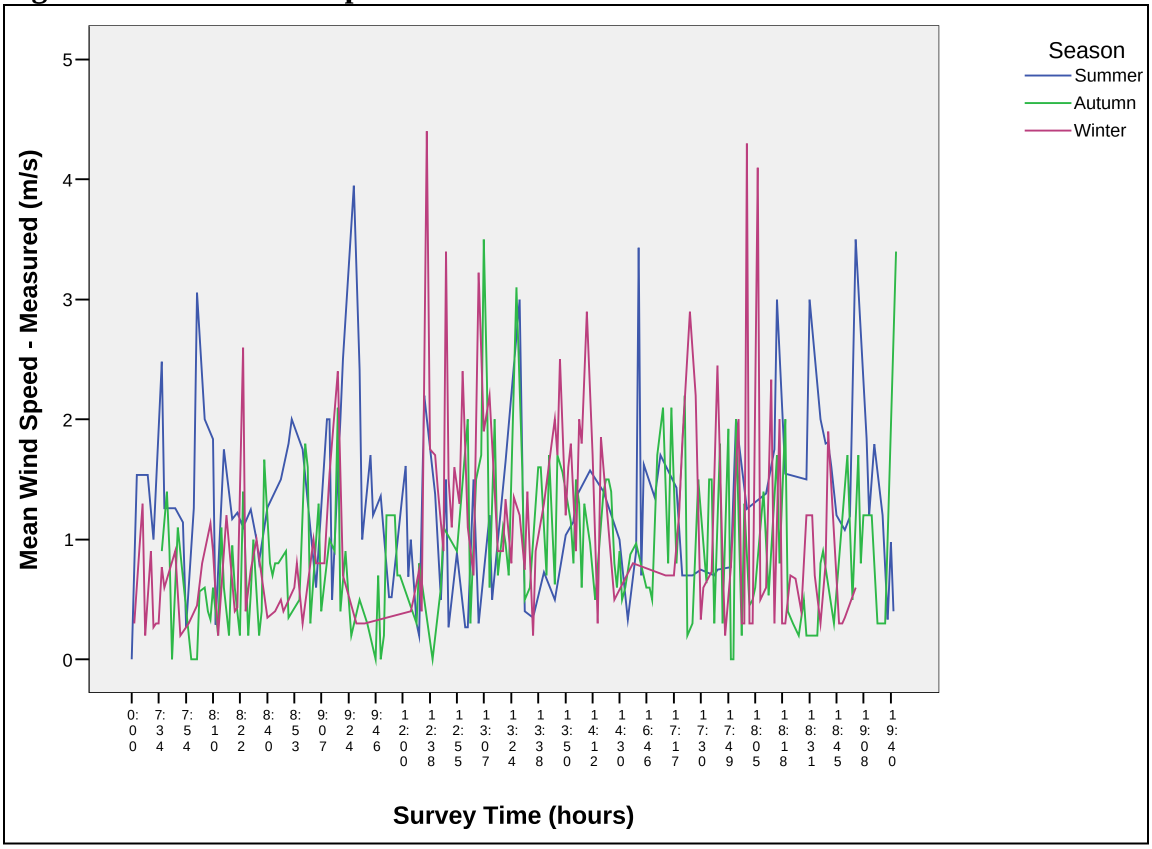


Figure E.3: Wind Speeds Measured Per Season

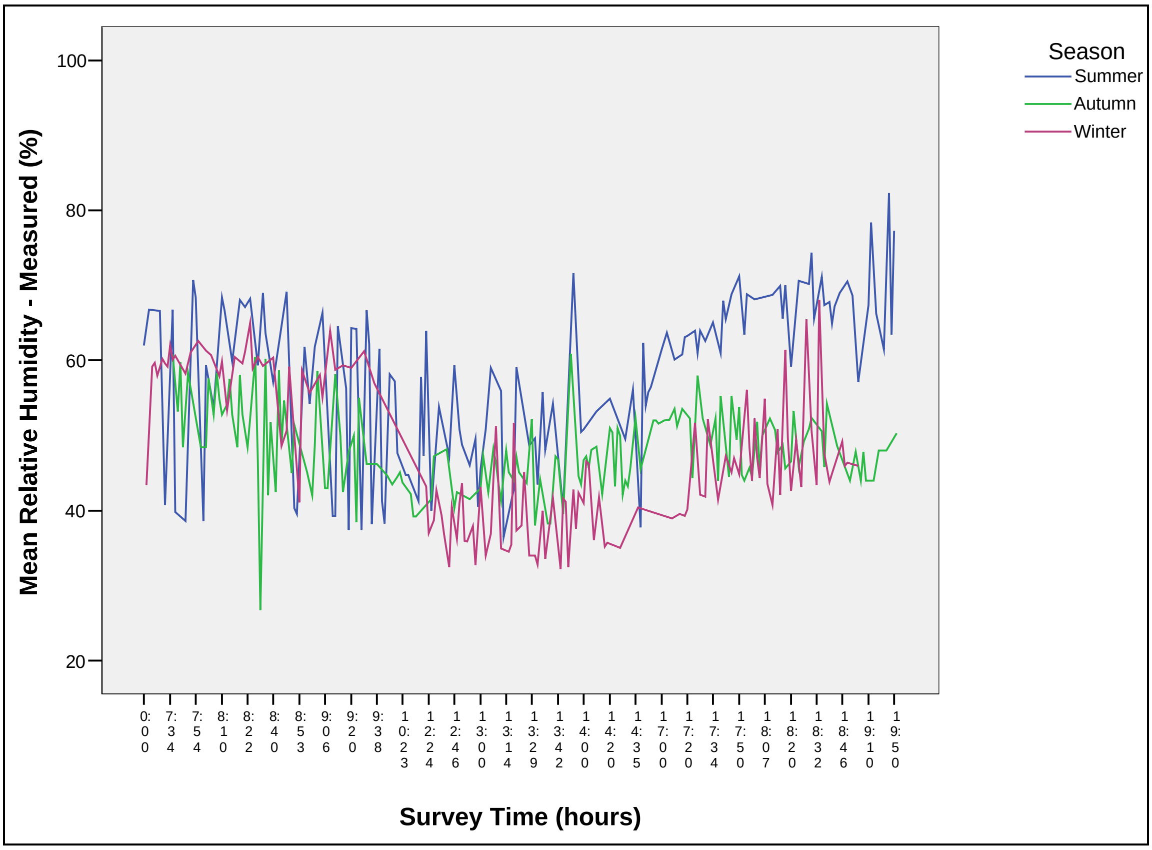


Figure E.4: Relative Humidity Measured Per Season

Appendix F: Compilation of Survey Results

Survey Database: Summer – September 24, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
1	SZR	Summer	24-Sep-08	7:10:00	34.8	454.5	47	3.09	31.1	32	66.8	1.54	3	1	0	-1	0	1	2	2	1	10	6	1	Manila	Phils	2.0	0	20	3	more buses	2	2	2	0	0	0	0	0	0	0	0	
2	SZR	Summer	24-Sep-08	7:10:00	34.8	454.5	47	3.09	31.1	32	66.8	1.54	3	1	0	-1	0	1	2	2	1	10	6	1	Manila	Phils	4.0	0	20	3	more buses	2	2	2	0	0	0	0	0	0	0	0	
3	SZR	Summer	24-Sep-08	7:25:00	34.8	454.5	47	3.09	31.1	32	66.6	1.54	3	1	1	-1	1	0	2	2	1	10	6	1	Travandrum	India	2.0	0	20	3	more shade	2	1	1	1	0	0	0	0	0	0	0	
4	SZR	Summer	24-Sep-08	7:40:00	34.8	454.5	47	3.09	32.8	34	66.8	2.48	4	1	0	0	0	1	3	2	1	10	1	0	Cagayan	Phils	1.5	0	20	3	more shade, l	2	2	1	1	0	0	0	0	0	0	0	
5	SZR	Summer	24-Sep-08	7:53:00	34.8	454.5	47	3.09	31.2	31	70.7	1.14	4	1	0	-1	0	0	2	2	1	10	0	0	Chennai	India	3.0	0	20	3	prevent heat	2	1	1	0	0	0	0	0	0	0	0	
6	SZR	Summer	24-Sep-08	7:54:00	34.8	454.5	47	3.09	33	32.7	68.4	0.27	4	1	0	-1	-1	0	2	1	16	10	6	1	Kerala	India	2.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
7	SZR	Summer	24-Sep-08	8:10:00	36.6	454.5	42	1.54	32.9	36	65.4	0.67	3	-1	0	-2	1	0	1	2	1	10	0	0	Hyderabad	India	0.2	0	20	3	to have own c	2	1	1	1	0	0	0	0	0	0	0	
8	SZR	Summer	24-Sep-08	8:11:00	36.6	454.5	42	1.54	32.6	33	66.7	0.29	5	1	0	-2	0	0	2	2	1	10	6	1	Pasig	Phils	1.0	0	20	3	have snow	2	1	1	0	0	0	0	0	0	0	1	
9	SZR	Summer	24-Sep-08	8:18:00	36.6	454.5	42	1.54	32.8	33	68.1	1.17	4	0	0	0	-1	1	3	2	1	10	6	0	Bohol	Phils	0.2	0	20	3	more buses, r	2	2	1	0	0	0	0	0	0	0	0	
10	SZR	Summer	24-Sep-08	8:30:00	36.6	454.5	42	1.54	33	40	70	0.4	5	1	1	-1	0	1	2	3	1	15	7	1	England	UK	0.0	0	20	3	more public tr	3	1	1	1	0	0	0	0	0	0	0	
11	SZR	Summer	24-Sep-08	8:36:00	36.6	454.5	42	1.54	32.6	35	65.1	0.63	4	2	1	0	-1	0	5	2	1	10	2	1	Batangas	Phils	4.0	0	20	3	more buses	2	2	1	0	0	0	0	0	0	0	0	
12	SZR	Summer	24-Sep-08	9:30:00	35.8	454.5	51	5.66	35.6	37	66.7	2.41	4	2	1	-2	-1	0	3	2	1	10	0	0	Cagayan	Phils	1.0	1	20	3	better bus sto	2	1	1	0	0	0	0	0	0	0	1	
13	SZR	Summer	24-Sep-08	9:30:00	35.8	454.5	51	5.66	35.6	37	66.7	2.41	4	2	1	-2	-1	0	3	2	1	10	0	0	Cagayan	Phils	1.0	1	20	3	better bus sto	2	1	1	0	0	0	0	0	0	0	1	
14	SZR	Summer	24-Sep-08	0:00:00	33.4	454.5	60	5.66	40.6	60	62	0	5	0	0	0	-1	0	1	3	16	19	0	0	Kuwait	Kuwait	0.5	1	20	3		3	1	1	1	0	0	0	0	0	0	1	
15	SZR	Summer	24-Sep-08	12:10:00	33.4	454.5	60	5.66	40.3	60	61.7	1.5	5	1	1	0	-1	0	1	3	1	11	1	0		Pakistan	8.0	1	40	3	more taxi & p	3	2	1	1	0	0	0	0	0	0	1	
16	SZR	Summer	24-Sep-08	12:20:00	33.4	454.5	60	5.66	40	62	64	1	6	1	0	0	0	1	2	3	2	14	4	1	Mississippi	USA	2.0	0	20	3		3	1	1	1	0	0	0	0	0	0	0	
17	SZR	Summer	24-Sep-08	12:46:00	33.4	454.5	60	5.66	40.8	65	59.4	0.5	6	2	0	-1	-1	1	1	1	2	14	1	1	Falmouth	UK	0.0	0	51	3		3	1	1	1	0	0	0	0	0	0	0	
18	SZR	Summer	24-Sep-08	12:50:00	33.4	454.5	60	5.66	41.6	57	58.4	0.27	4	2	1	0	1	0	2	2	1	20	2	1	Pampanga	Phils	6.0	0	40	2		2	2	1	0	0	0	0	0	0	0	0	
19	SZR	Summer	24-Sep-08	13:05:00	32.9	454.5	60	5.66	40.2	64	59	0.3	4	2	1	-1	0	0	3	2	1	19	2	1	Hyderabad	India	3.0	0	20	3	working bus s	2	1	1	0	0	0	0	0	0	0	0	
20	SZR	Summer	24-Sep-08	13:10:00	32.9	454.5	64	5.66	40.2	64	59	0.3	4	1	0	0	0	1	1	2	1	10	7	1	Pampanga	Phils	1.0	1	20	3		2	2	2	0	0	0	0	0	0	0	0	
21	SZR	Summer	24-Sep-08	13:10:00	32.9	454.5	64	5.66	40.2	64	59	0.3	5	1	0	0	0	1	1	2	2	10	0	0	Tarlac	Phils	3.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
22	SZR	Summer	24-Sep-08	13:20:00	32.9	454.5	64	5.66	40.2	64	59	0.3	4	1	0	0	0	1	1	3	2	14	0	0		Phils	2.0	0	20	3		3	2	2	1	0	0	0	0	0	0	0	
23	SZR	Summer	24-Sep-08	13:30:00	32.9	454.5	64	5.66	40.2	64	59	0.3	5	2	1	-2	1	0	1	1	3	19	2	1	Damascus	Syria	27.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
24	SZR	Summer	24-Sep-08	13:40:00	32.9	454.5	64	5.66	37.9	53	64.1	0.3	5	2	0	-2	-1	0	3	1	2	10	0	0		Kenya	0.6	0	20	3	change weath	1	2	1	1	0	0	0	0	0	0	0	
25	SZR	Summer	24-Sep-08	13:50:00	32.9	454.5	64	5.66	33.7	39	78.7	1	4	0	0	0	0	0	3	1	2	12	6	0	Kerala	India	0.8	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
26	SZR	Summer	24-Sep-08	13:50:00	32.9	454.5	64	5.66	33.7	39	78.7	1	3	0	0	0	0	0	3	1	2	12	6	0	Kerala	India	0.8	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
27	SZR	Summer	24-Sep-08	13:50:00	32.9	454.5	64	5.66	33.7	39	78.7	1	3	0	0	0	0	0	3	1	2	12	6	0	Kerala	India	0.8	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
28	SZR	Summer	24-Sep-08	14:00:00	32.2	454.5	67	4.63	40	57	60	1	4	1	0	0	-1	0	5	3	10	10	3	0	Lahore	Pakistan	0.2	1	55	3	proper bus sto	1	1	1	0	0	0	0	0	0	0	0	
29	SZR	Summer	24-Sep-08	14:00:00	32.2	454.5	67	4.63	39.6	57	63.1	1.3	4	0	0	0	-1	0	5	3	10	10	6	0	Pangasinan	Phils	0.3	0	20	3	proper bus sto	1	1	2	0	0	0	0	0	0	0	0	
30	SZR	Summer	24-Sep-08	14:00:00	32.2	454.5	67	4.63	39.6	57	63.1	1.3	6	0	0	0	-1	0	5	3	10	10	6	0	Pangasinan	Phils	4.0	0	20	3	proper bus sto	1	1	2	0	0	0	0	0	0	0	0	
31	SZR	Summer	24-Sep-08	14:10:00	32.2	454.5	67	4.63	39.6	57	63.1	1.3	4	0	1	0	0	0	4	2	2	10	6	0		Phils	4.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
32	SZR	Summer	24-Sep-08	14:10:00	32.2	454.5	67	4.63	39.6	57	63.1	1.3	6	0	0	0	0	1	3	3	3	22	6	1		South Africa	6.0	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
33	SZR	Summer	24-Sep-08	14:20:00	32.2	454.5	67	4.63	39.6	57	63.1	1.3	4	2	0	0	-1	1	3	3	2	22	0	0	Andhraprade	India	10.0	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
34	SZR	Summer	24-Sep-08	17:50:00	32.2	454.5	63	2.57	34.7	40	71.2	0.77	3	2	0	-1	-1	1	3	1	2	10	6	1	Kerala	India		0	20	3		2	1	1	0	0	0	0	0	0	0	0	
35	SZR	Summer	24-Sep-08	18:00:00	31.9	454.5	69	3.6	34.7	40	71.2	0.77	4	0	0	-1	0	1	4	1	1	14	1	1	Lahore	Pakistan	2.0	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
36	SZR	Summer	24-Sep-08	18:10:00	31.9	454.5	69	3.6	34.7	40	71.2	0.77	4	0	0	0	0	1	3	3	2	10	6	1	Delhi	India		1	20	3		3	2	1	0	0	0	0	0	0	0	0	
37	SZR	Summer	24-Sep-08	18:10:00	31.9	454.5	69	3.6	34.7	40	71.2	0.77	5	1	0	-1	-1	0	5	3	10	61	6	1	Islamabad	Pakistan	19.0	1	20	2		3	1	1	0	0	0	0	0	0	0	0	
38	SZR	Summer	24-Sep-08	18:10:00	31.9	454.5	69	3.6	34.7	40	71.2	0.77	4	1	1	-1	0	0	3	3	2	11	5	1	Canberra	Australia	2.5	0	20	3	more gardens	3	2	1	0	0	0	0	0	0	0	0	
39	SZR	Summer	24-Sep-08	18:15:00	31.9	454.5	69	3.6	33.8	34	76.4	1.5	4	2	1	0	-1	1	2	1	2	10	4	1	Cape Town	South Africa	0.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
40	SZR	Summer	24-Sep-08	18:30:00	31.9	454.5	69	3.6	34.3	39	74.4	1.5	3	1	1	0	-1	1	2	1	2	10	6	1	Batangas	Phils	0.3	0	20	3	proper bus sto	2	1	1	0	0	0	0	0	0	0	0	
41	SZR	Summer	24-Sep-08	18:40:00	31.9	454.5	69	3.6	33.8	37	74.8	1.5	4	1		0	0	1	1	3	2	10	6	1	Andhraprade	India	10.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
42	SZR	Summer	24-Sep-08	18:50:00	31.9	454.5	69	3.6	33.8	37	74.8	1.5	5	0		-1	1	1	3	1	11	23	0	0	Lahore	Pakistan		0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
43	SZR	Summer	24-Sep-08	18:50:00	31.9	454.5	69	3.6	33	38	76.2	0.35	5	0		-1	0	1	1	1	11	23	0	0	Istanbul	Turkey		0	20	3		2	1	3	0	0	0	0	0	0	0	0	smoking
44	SZR	Summer	24-Sep-08	18:50:00	31.9	454.5	69	3.6	33	38	76.2	0.35	4	0		-1	0	1	1	1	11	23	0	0	Istanbul	Turkey		0	20	3		2	1	3	0	0	0	0	0	0	0	0	smoking
45	SZR	Summer	24-Sep-08	18:55:00	31.9	454.5	69	3.6	32.7	37	78.4	1.2	4	0		0	-1	0	3	2	2	10	5	1	Calicut	India	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
46	SZR	Summer	24-Sep-08	19:10:00	31.5	454.5	74	4.12	32.7	37	78.4	1.2	5	0		0	0	1	4	3	12	22	2	1	Los Angeles	USA	0.0	1	51	3		3	1	1	0	0	0	0	0	0	0	0	
47	SZR	Summer	24-Sep-08	19:15:00	31.5	454.5	74	4.12	32.7	37	78.4	1.2	5	2		-1	-1	0	2	1	1	21	7	1	Johannesbur	South Africa	0.5	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
48	SZR	Summer	24-Sep-08	19:20:00	31.5	454.5	74	4.12	32.7	37	78.4	1.2	5	0		0	0	1	5	1	11	10	1	1		Nepal	1.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
49	SZR	Summer	24-Sep-08	19:30:00	31.5	454.5	74	4.12	34	38	76.5	1	4	2		0	-1	1	4	2	2	10	1	1	Gujarat	India	6.0	0	20	3	benches, natu	1	1	1	0	0	0	0	0	0	0	0	
50	SZR	Summer	24-Sep-08	19:35:00	31.5	454.5	74	4.12	31.8	34	82.3	0.33	4	0		0	0	1	5	3	2	12	0	1	Leyte	Phils	9.0	0	20	2	more interacti	1	1	2	0	0	0	0	0	0	0	0	
51	SZR	Summer	24-Sep-08	19:35:00	31.5	454.5	74	4.12	31.8	34	82.3	0.33	5	0		0	0	1	5	3	2	12	0	1	Pampanga	Phils	3.0	0	20	3	more interacti	1	1	2	0	0	0	0	0	0	0	0	
52	SZR	Summer	24-Sep-08	19:40:00	31.5	454.5	74	4.12	31.8	34	82.3	0.33	4	0		0	0	1	5	1	11	10	6	1	Kerala	India	0.5	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
53	SZR	Summer	24-Sep-08	19:50:00	31.5	454.5	74	4.12	33.2	36	77.3	0.4	4	0		0	1	0	2	1	11	23	0	0	Gasa Strip	Palestine	0.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking

Survey Database: Summer – September 25, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
54	Deira	Summer	25-Sep-08	8:00:00	38.0	466.1	25	2.57	33.4	38	71.3	3	4	0	0	0	0	1	3	2	1	10	3	0	Bulacan	Phils	11.0	0	20	3	make indoor s	2	1	1	0	0	0	0	1	0	0	0	
55	Deira	Summer	25-Sep-08	8:10:00	38.0	466.1	25	2.57	33.4	38	71.3	3	5	1	0	-1	0	1	3	2	1	10	7	1	Rizal	Phils	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
56	Deira	Summer	25-Sep-08	8:15:00	38.0	466.1	25	2.57	34.4	37	64.2	1.5	4	0	0	-1	0	1	2	2	1	10	5	1	Hyderabad	India	3.0	1	20	3	make home n	2	1	1	0	0	0	0	0	0	0	1	
57	Deira	Summer	25-Sep-08	8:20:00	38.0	466.1	25	2.57	34.4	37	64.2	1.5	4	0	0	0	0	1	2	2	1	10	5	1	Amman	Jordan	2.0	1	20	2	bus stop with	2	1	1	0	0	0	0	0	0	0	1	
58	Deira	Summer	25-Sep-08	8:20:00	38.0	466.1	25	2.57	35.3	35	67.7	1.2	4	2	1	-1	1	0	2	2	1	10	5	1		Tunisia	2.0	1	20	3		2	2	2	0	0	0	0	0	0	0	1	
59	Deira	Summer	25-Sep-08	8:20:00	38.0	466.1	25	2.57	35.3	35	67.7	1.2	4	2	1	-1	1	0	2	2	1	10	7	1		Morocco	3.0	1	20	3		2	2	2	0	0	0	0	0	0	1	0	
60	Deira	Summer	25-Sep-08	8:25:00	38.0	466.1	25	2.57	35.7	35	67.5	1.2	4	0	0	0	-1	0	3	2	1	10	6	1	Bulacan	Phils	0.4	0	20	3	more buses	2	1	1	0	0	0	0	0	0	0	0	
61	Deira	Summer	25-Sep-08	8:36:00	38.0	466.1	25	2.57	37.5	46	62.2	1	5	2	1	0	-1	0	2	2	1	10	0	0	Chennai	India	6.0	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
62	Deira	Summer	25-Sep-08	8:40:00	38.0	466.1	25	2.57	37.5	46	62.2	1	3	2	0	0	-1	0	5	2	1	10	0	0	Delhi	India	1.5	1	20	3		2	1	2	1	0	0	0	0	0	0	0	
63	Deira	Summer	25-Sep-08	8:47:00	38.0	466.1	25	2.57	34.5	36	69.2	1.5	6	0	0	0	-1	0	4	2	1	10	6	0	Bombay	India	10.0	0	20	3	more buses, t	2	2	1	0	0	0	0	0	0	1	1	
64	Deira	Summer	25-Sep-08	8:57:00	38.0	466.1	25	2.57	34.5	36	69.2	1.5	4	0	1	0	0	1	3	2	1	10	5	1	Baghdad	Iraq	2.0	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
65	Deira	Summer	25-Sep-08	9:05:00	38.0	466.1	34	5.14	37.1	42	66.4	0.6	4	0	0	0	0	1	5	3	1	11	6	1	Davao	Phils	0.3	1	20	3	more buses	3	1	1	1	0	0	0	0	0	0	1	
66	Deira	Summer	25-Sep-08	9:12:00	38.0	466.1	34	5.14	34	34	68.7	0.5	5	1	0	-1	0	1	2	1	1	19	0	0	Manila	Phils	0.3	0	20	3	make more m	1	1	2	0	0	0	0	0	0	0	0	
67	Deira	Summer	25-Sep-08	9:12:00	38.0	466.1	34	5.14	34	34	68.7	0.5	4	1	0	-1	0	1	2	1	1	19	7	1	Negros	Phils	3.0	0	20	2	make more m	1	1	2	0	0	0	0	0	0	0	1	
68	Deira	Summer	25-Sep-08	9:20:00	38.0	466.1	34	5.14	34.7	36	64.3	2.5	4	0	0	0	0	1	3	2	1	10	7	1	Cebu	Phils	2.0	0	20	3	more buses &	2	1	1	0	0	0	0	1	0	0	1	
69	Deira	Summer	25-Sep-08	9:40:00	38.0	466.1	34	5.14	36.3	34	44	1.9	3	2	0	1	-1	1	3	3	1	11	8	1	Yupi	India	6.0	1	20	2		3	1	1	0	0	0	0	0	0	0	0	
70	Deira	Summer	25-Sep-08	10:00:00	36.7	466.1	45	5.66	35.8	34	47.7	1.36	3	0	1	0	-1	1	2	1	13	10	7	1	Kerala	India	2.5	1	20	3		1	1	2	0	0	0	0	1	0	0	1	
71	Deira	Summer	25-Sep-08	10:00:00	36.7	466.1	45	5.66	35.8	34	47.7	1.36	4	0	1	0	0	1	2	1	13	10	7	1	Kerala	India	3.0	1	20	3		1	1	2	0	0	0	0	0	0	0	0	
72	Deira	Summer	25-Sep-08	10:30:00	36.7	466.1	45	5.66	37.2	35	44.8	0.52	4	2	1	0	-1	1	5	1	10	20	6	1	Dubai	UAE	20.0	1	20	2		2	1	2	0	0	0	0	1	0	0	1	
73	Deira	Summer	25-Sep-08	10:35:00	36.7	466.1	45	5.66	37.2	35	44.8	0.52	3	2	1	-2	-1	1	5	3	10	20	6	1	Dubai	UAE	20.0	1	20	3		2	1	2	0	0	0	0	1	0	0	0	
74	Deira	Summer	25-Sep-08	12:10:00	34.8	466.1	51	6.17	40.5	47	54	1.72	4	2	0	-1	0	0	5	1	14	10	0	1	Isabela	Phils	1.2	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
75	Deira	Summer	25-Sep-08	12:15:00	34.8	466.1	51	6.17	41.2	42	55.3	0	5	1	1	0	0	1	4	2	3	10	5	1	Bataan	Phils	2.5	1	20	3	green, more v	2	1	2	0	0	0	0	1	0	0	1	
76	Deira	Summer	25-Sep-08	12:35:00	34.8	466.1	51	6.17	41.5	48	53.8	2.2	6	2	0	-1	-1	1	2	3	1	10	2	1	Andhraprade	India	5.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
77	Deira	Summer	25-Sep-08	12:40:00	34.8	466.1	51	6.17	42	63	55.8	2.1	3	2	1	-1	0	0	3	3	11	21	0	1	Tunis	Tunisia	2.0	1	20	3		3	1	1	1	0	0	0	0	0	0	0	
78	Deira	Summer	25-Sep-08	12:48:00	34.8	466.1	51	6.17	42.3	57	50.8	1.5	5	2	1	-2	-1	0	5	3	10	10	6	1	Kerala	India	0.2	1	20	3		2	1	1	0	0	0	0	1	0	0	1	
79	Deira	Summer	25-Sep-08	12:55:00	34.8	466.1	51	6.17	42.3	57	50.8	1.5	3	2	0	-1	0	0	2	3	11	22	7	1	Damascus	Syria	2.0	0	20	3		3	1	1	1	0	0	0	1	0	0	1	
80	Deira	Summer	25-Sep-08	13:02:00	34.5	466.1	52	6.17	42.3	57	50.8	1.5	6	0	1	-2	-1	1	3	1	14	12	1	1	Dubai	UAE	40.0	1	20	3		3	1	1	0	0	0	0	0	0	1	0	
81	Deira	Summer	25-Sep-08	13:10:00	34.5	466.1	52	6.17	42.2	55	49.8	3	4	0	1	-1	-1	0	3	2	15	10	2	0	Kerala	India	1.5	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
82	Deira	Summer	25-Sep-08	13:20:00	34.5	466.1	52	6.17	37.4	35	59.2	3	4	1	0	-2	-1	0	2	2	2	19	6	1	Swaida	Syria	2.5	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
83	Deira	Summer	25-Sep-08	13:27:00	34.5	466.1	52	6.17	37.4	35	59.2	3	3	2	1	-2	-1	0	2	1	2	10	5	1	Delhi	India	18.0	1	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	1	
84	Deira	Summer	25-Sep-08	13:35:00	34.5	466.1	52	6.17	37.8	36	55.8	0.35	6	0	0	0	-1	1	3	2	1	10	5	1	Manila	Phils	12.0	1	20	3	shading, AC I	2	1	1	0	0	0	0	0	0	0	1	
85	Deira	Summer	25-Sep-08	13:40:00	34.5	466.1	52	6.17	37.4	36	50.5	1.15	4	1	0.5	-1	-1	0	2	1	16	10	0	1	Kerala	India	10.0	1	20	3	less traffic	2	1	1	0	0	0	0	0	0	0	0	
86	Deira	Summer	25-Sep-08	13:50:00	34.5	466.1	52	6.17	37.4	36	50.5	1.15	4	2	1	0	0	0	3	2	1	10	6	1	Hyderabad	India	10.0	0	20	2		2	2	1	0	0	0	0	0	0	1	0	
87	Deira	Summer	25-Sep-08	13:56:00	34.5	466.1	52	6.17	37.4	36	50.5	1.15	4	1	0	-1	0	1	3	2	1	10	6	1	Kerala	India	5.0	1	20	3	more buses	2	1	1	0	0	0	0	0	0	0	1	
88	Deira	Summer	25-Sep-08	14:00:00	34.7	466.1	44	5.66	37.4	36	50.5	1.15	6	1	1	-1	0	1	4	2	5	10	1	1		Sudan	2.0	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
89	Deira	Summer	25-Sep-08	14:10:00	34.7	466.1	44	5.66	40.4	49	54	1.28	3	2	1	0	-1	0	3	1	1	10	2	0		Palestine	1.2	1	20	3		1	1	1	0	0	0	0	0	0	0	0	
90	Deira	Summer	25-Sep-08	14:34:00	34.7	466.1	44	5.66	38.1	47	56.1	0.33	4	1	0	-2	-1	1	3	2	2	10	0	0	NWFPDIK	Pakistan	1.3	1	20	3	more retail sp	2	1	1	0	0	0	0	0	0	0	0	
91	Deira	Summer	25-Sep-08	14:44:00	34.7	466.1	44	5.66	35.8	44	62.3	3.43	4	1	0	0	1	0	3	3	2	11	6	1	Cameroon	Africa	1.8	0	20	3	more bus stop	3	1	1	0	0	0	0	0	0	0	0	
92	Deira	Summer	25-Sep-08	15:00:00	34.3	466.1	44	4.12	40.2	39	55.8		3	2	1	-1	-1	0	4	2	2	10	6	1	Chennai	India	4.0	1	20	3		2	1	1	0	0	0	0	0	0	0	0	
93	Deira	Summer	25-Sep-08	15:10:00	34.3	466.1	44	4.12	38.5	39	56.5	1.62	4	1	0	-1	-1	0	2	1	16	60	2	1	Mansura	Egypt	1.0	1	20	3	more bus & ta	2	1	1	0	0	0	0	0	0	0	0	
94	Deira	Summer	25-Sep-08	17:00:00	33.5	466.1	43	4.12	36.5	47	59.6	2	3	0	0	0	0	1	2	1	2	10	5	0	Bihar	India	0.1	1	20	3		1	1	1	0	0	0	0	0	0	0	0	
95	Deira	Summer	25-Sep-08	17:05:00	33.5	466.1	43	4.12	36.3	43	63.7	1.7	3	1	0	0	0	0	1	1	2	10	6	0	Manila	Phils	0.1	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
96	Deira	Summer	25-Sep-08	17:18:00	33.5	466.1	43	4.12	36.8	47	60.8	1.43	7	0	0	0	0	1	4	1	3	32	7	1	Islamabad	Pakistan	34.0	1	20	3		1	1	1	0	0	0	0	0	0	0	0	
97	Deira	Summer	25-Sep-08	17:30:00	33.5	466.1	43	4.12	36.1	45	62.6	0.75	3	0	0	0	0	1	5	1	2	10	8	0	Kerala	India	1.0	1	20	3		1	1	2	0	0	0	0	0	0	0	0	
98	Deira	Summer	25-Sep-08	17:40:00	33.5	466.1	43	4.12	36.1	45	62.6	0.75	3	1		-1	-1	0	1	1	16	22	8	1	Quezon City	Phils	3.0	0	20	3	more buses	3	1	1	0	0	0	0	0	0	0	1	
99	Deira	Summer	25-Sep-08	17:52:00	33.5	466.1	43	4.12	35.6	41	63.5	2	5	2		0	-1	0	2	1	1	10	6	1		China	2.0	0	20	3		1	2	1	0	0	0	0	0		0	0	
100	Deira	Summer	25-Sep-08	18:00:00	33.5	466.1	39	3.6	35.6	41	63.5	2	4	2		1	0	1	3	1	5	10	5	1	Agadar	Morocco	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
101	Deira	Summer	25-Sep-08	18:15:00	33.5	466.1	39	3.6	35.6	41	63.5	2	5	1		-1	-1	0	1	3	4	61	7	1	Quezon City	Phils	3.0	0	20	2		3	1	1	0	0	0	0	0	0	0	0	
102	Deira	Summer	25-Sep-08	18:20:00	33.5	466.1	39	3.6	35.7	42	59.2	1.55	2	0		0	0	1	5	3	1	22	3	1		Iran	2.0	0	10	2		3	1	3	0	0	0	0	0	0	0	0	
103	Deira	Summer	25-Sep-08	18:20:00	33.5	466.1	39	3.6	35.7	42	59.2	1.55	3	0		0	0	1	5	3	1	22	3	1		Iran	8.0	0	10	2		3	1	3	0	0	0	0	0	0	0	0	
104	Deira	Summer	25-Sep-08	18:20:00	33.5	466.1	39	3.6	35.7	42	59.2	1.55	2	0		0	0	1	5	3	1	22	3	1		Iran	2.0	0	10	1		3	1	3	0	0	0	0	0	0	0	0	
105	Deira	Summer	25-Sep-08	18:40:00	33.5	466.1	39	3.6	34.9	37	55.1	2.12	4	0		-1	0	1	5	2	2	10	1	0	Kathmandu	Nepal	3.5	0	20	2	more buses	2	1	2	0	0	0	0	0	0	0	0	
106	Deira	Summer	25-Sep-08	18:50:00	33.5	466.1	39	3.6	34.9	37	55.1	2.12	4	0		0	0	1	1	3	2	55	7	1		Georgia	1.0	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
107	Deira	Summer	25-Sep-08	18:55:00	33.5	466.1	39	3.6	34.9	37	55.1	2.12	3	1		-1	-1	0	3	3	2	11	7	1	Kerala	India	0.7	0	20	3		3	1	1	1	1	0	0	0	0	0	0	
108	Deira	Summer	25-Sep-08	19:00:00	33.2	466.1	40	4.12	34.5	33	57.1	3.5	4	0		0	-1	1	5	1	14	43	6	0	Lahore	Pakistan	6.0	0	20	2		1	1	2	0	0	0	0	0	0	0	0	
109	Deira	Summer	25-Sep-08	19:10:00	33.2	466.1	40	4.12	34.5	38	56.3	2.48	6	1		0	-1	1	1	4	16	11	3	0	Bristol	UK	0.0	0	20	3	seating areas	3	1	1	0	0	0	0	0	0	0	0	
110	Deira	Summer	25-Sep-08	19:20:00	33.2	466.1	40	4.12	34.6	38	54.2	2.39	5	0		0	0	1	2	1	1	22	3	0	Bangalore	India	9.0	1	20	3	less traffic	3	2	1	0	0	0	0	0	0	1	0	
111	Deira	Summer	25-Sep-08	19:30:00	33.2	466.1	40	4.12	34.8	39	54	1.3	4	0		0	0	1	2	3	12	11	2	0		Kenya	0.3	0	20	3	more fountain	3	2	2	0	0	0	0	0	0	0	0	
112	Deira	Summer	25-Sep-08	19:30:00	33.2	466.1	40	4.12	34.8	39	54	1.3	4	0		-1	0	1	2	3	12	11	2	0		Kenya	3.0	0	20	3	more fountain	3	1	2	0	0	0	0	0	0	0	0	
113	Deira	Summer	25-Sep-08	19:40:00	33.2	466.1	40	4.12	34.8	39	54	1.3	7	2		-1	-1	0	3	3	12	10	0	0	Melbourne	Australia	0.0	0	51	3	more taxis, tr	1	2	2	0	0	0	0	0	0	0	0	
114	Deira	Summer	25-Sep-08	19:40:00	33.2	466.1	40	4.12	34.8	39	54	1.3	8	2		-1	-1	0	3	3	12	10	0	0	Melbourne	Australia	0.0	0	51	3	more taxis, tr	1	2	2	0	0	0	0	0	0	0	0	

Survey Database: Summer – September 26, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
115	Deira	Summer	26-Sep-08	7:30:00	38.4	470.8	19	4.63	30.5	36	40.8	1	4	0	0	0	0	1	3	2	1	10	6	1	Kerala	India	4.0	0	20	3	AC bus stops	1	1	1	1	0	0	0	0	0	0	0	
116	Deira	Summer	26-Sep-08	7:45:00	38.4	470.8	19	4.63	32.8	36	39.8	1.26	5	0	0	0	0	1	3	3	1	10	7	1	Nueva Ecija	Phils	7.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
117	Deira	Summer	26-Sep-08	7:50:00	38.4	470.8	19	4.63	33.3	35	38.6	1.26	4	0	1	-2	0	0	3	3	1	19	7	1	Capital City	Tunisia	2.5	1	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	0	
118	Deira	Summer	26-Sep-08	7:59:00	38.4	470.8	19	4.63	33.3	35	38.6	1.26	4	0	0	0	0	1	2	3	1	10	8	1	Kerala	India	6.0	0	20	2	AC bus stops	2	1	2	0	0	0	0	0	0	0	0	
119	Deira	Summer	26-Sep-08	7:59:00	38.4	470.8	19	4.63	33.3	35	38.6	1.26	4	0	0	0	0	1	2	3	1	10	8	1	Kerala	India	4.0	0	20	2	AC bus stops	2	1	2	0	0	0	0	0	0	0	0	
120	Deira	Summer	26-Sep-08	8:00:00	40.2	470.8	15	4.12	33.6	38	38.4	3.11	5	0	0	0	0	1	2	2	16	10	0	0	Khalthoum	Sudan	11.0	1	20	3		2	1	1	1	0	0	0	0	1	0	0	
121	Deira	Summer	26-Sep-08	8:05:00	40.2	470.8	15	4.12	33.2	36	39	2	4	1	0	0	0	0	3	2	16	10	7	1	Nueva Ecija	Phils	3.0	0	20	3	AC bus stops	2	1	1	0	0	0	0	1	0	0	1	
122	Deira	Summer	26-Sep-08	8:15:00	40.2	470.8	15	4.12	33.6	38	38.4	2	5	0	0	0	0	1	1	2	1	10	1	1	Bicol	Phils	4.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
123	Deira	Summer	26-Sep-08	8:30:00	40.2	470.8	15	4.12	32.8	35	39	2.35	5	0	0	0	1	1	3	1	1	10	1	1	Goa	India	17.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
124	Deira	Summer	26-Sep-08	8:40:00	40.2	470.8	15	4.12	32.7	34	40.3	1.8	5	1	0	-1	0	1	3	1	1	10	7	1	Bulacan	Phils	3.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
125	Deira	Summer	26-Sep-08	8:50:00	40.2	470.8	15	4.12	32.8	34	40.3	1.8	4	1	0	-2	1	1	3	3	1	11	7	0	Bombay	India	1.7	1	20	2		3	1	1	0	0	0	0	0	0	0	0	
126	Deira	Summer	26-Sep-08	8:52:00	40.2	470.8	15	4.12	33.2	34	39.6	2	4	1	0	0	0	1	3	3	1	10	1	1	Jank	India	1.0	1	20	3	could have ha	2	1	1	0	0	0	0	0	0	0	1	
127	Deira	Summer	26-Sep-08	8:57:00	40.2	470.8	15	4.12	33.4	33	39.3	2	4	0	1	0	0	1	2	1	1	10	2	1	Laguna	Phils	4.0	0	20	3		1	1	1	0	0	0	0	0	0	0	1	
128	Deira	Summer	26-Sep-08	9:09:00	39.3	470.8	23	5.66	33.4	33	39.3	2	6	0	0	0	0	1	1	3	16	11	6	1	Mumbai	India	12.0	0	20	3		3	2	1	0	0	0	0	0	0	0	1	
129	Deira	Summer	26-Sep-08	9:10:00	39.3	470.8	23	5.66	33.4	33	39.3	2	7	0	0	0	0	1	4	3	1	22	7	1	Kerala	India	29.0	0	20	3	more trees, sl	3	1	1	1	0	0	0	0	0	0	0	
130	Deira	Summer	26-Sep-08	9:18:00	39.3	470.8	23	5.66	36.8	37	37.4	2	4	0	1	0	0	1	2	2	1	10	7	1	Bangalore	India	9.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
131	Deira	Summer	26-Sep-08	9:28:00	39.3	470.8	23	5.66	36.8	37	37.4	3.95	4	0	0	0	0	1	3	3	1	10	0	0	Quezon City	Phils	0.3	0	20	3	more buses	2	2	1	0	0	0	0	0	0	0	1	
132	Deira	Summer	26-Sep-08	9:34:00	39.3	470.8	23	5.66	37.1	47	38.2	1	2	2	0	0	0	1	3	1	16	10	0	0	Lahore	Pakista	15.0	1	10	2		1	1	2	1	0	0	0	0	0	0	0	
133	Deira	Summer	26-Sep-08	9:40:00	39.3	470.8	23	5.66	36.4	38	38.6	1.5	5	2	1	0	-1	1	2	3	1	10	7	1	Capiz	Phils	3.0	0	20	3	better waiting	2	2	1	0	0	0	0	0	0	0	0	
134	Deira	Summer	26-Sep-08	9:45:00	39.3	470.8	23	5.66	37.8	49	38.3	1.2	2	2	0	0	0	1	4	1	1	10	1	1	Khalthoum	Sudan	17.0	0	10	2		1	1	1	1	0	0	0	0	0	0	0	
135	Deira	Summer	26-Sep-08	12:00:00	35.6	470.8	40	6.69	44.2	48	41.3	1.38	4	2	1	0	0	1	2	1	1	10	6	1	Batangas	Phils	4.0	1	20	3	put big dome	2	1	1	0	0	0	0	0	0	0	0	
136	Deira	Summer	26-Sep-08	12:15:00	35.6	470.8	40	6.69	44.5	53	39.4	1.38	4	2	1	1	0	0	3	2	1	10	1	1	Bulacan	Phils	0.3	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
137	Deira	Summer	26-Sep-08	12:25:00	35.6	470.8	40	6.69	43.5	46	40	0.3	4	0	0	-1	0	1	3	3	3	22	3	1	Bangalore	India	4.0	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
138	Deira	Summer	26-Sep-08	12:30:00	35.6	470.8	40	6.69	43.4	45	38.4	0.2	4	1	2	-1	-1	0	2	1	1	15	0	0	Manila	Phils	4.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
139	Deira	Summer	26-Sep-08	12:30:00	35.6	470.8	40	6.69	43.4	45	38.4	0.2	4	1	1	-1	-1	0	2	1	1	10	0	0	Manila	Phils	1.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
140	Deira	Summer	26-Sep-08	12:40:00	35.6	470.8	40	6.69	44.2	58	40	0.65	3	2	1	0	-1	0	2	3	12	10	7	0	Kerala	India	0.4	1	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	0	
141	Deira	Summer	26-Sep-08	12:50:00	35.6	470.8	40	6.69	44	57	37.3	0.27	4	2	1	-2	-1	1	4	1	18	10	3	0	Kerala	India	1.0	0	55	3		2	1	1	0	0	0	0	0	0	0	0	
142	Deira	Summer	26-Sep-08	12:55:00	35.6	470.8	40	6.69	44	57	37.3	0.27	5	1	1	-1	-1	0	3	1	1	10	1	1	Manila	Phils	2.0	0	20	3		2	2	2	0	0	0	0	0	0	0	1	
143	Deira	Summer	26-Sep-08	12:59:00	35.6	470.8	40	6.69	41.5	47	40.5	0.27	4	0	1	-2	0	1	3	1	16	10	2	1	Alexandria	Egypt	2.0	1	20	3	more stores	2	1	1	0	0	0	0	0	0	0	0	
144	Deira	Summer	26-Sep-08	13:00:00	35.6	470.8	40	6.17	41.5	47	40.5	0.27	5	1	0	-1	0	1	3	1	14	11	2	1	Cairo	Egypt	2.0	1	20	3	lower tempera	3	1	1	1	0	0	0	0	0	0	1	
145	Deira	Summer	26-Sep-08	13:13:00	34.1	470.8	53	6.17	43.4	53	36.5	0.5	5	0	1	-1	0	1	3	1	14	11	0	0	Raba	Morocco	5.0	1	20	3	mall in the pe	2	1	1	0	0	0	0	0	0	0	0	
146	Deira	Summer	26-Sep-08	13:30:00	34.1	470.8	53	6.17	39	39	40.3	0.5	5	2	1	0	0	1	3	3	1	10	7	1	Bombay	India	3.0	1	20	1		3	1	1	0	0	0	0	0	0	0	0	
147	Deira	Summer	26-Sep-08	13:45:00	34.1	470.8	53	6.17	40.4	41	40.3	0.5	4	0	1	0	0	1	2	3	1	10	0	0	Kerala	India	0.4	1	20	3	internet facilit	2	1	1	0	0	0	0	0	0	0	0	
148	Deira	Summer	26-Sep-08	14:00:00	33.1	470.8	55	3.6	40.8	49	43	2	5	0	0	-2	-1	1	4	1	14	10	7	1	Khalthoum	Sudan	13.0	1	20	3	entertainment	2	1	1	0	0	0	0	1	0	0	1	
149	Deira	Summer	26-Sep-08	14:10:00	33.1	470.8	55	3.6	40.8	49	43	2	4	2	1	-2	-1	0	3	2	1	10	6	1	Manila	Phils	4.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
150	Deira	Summer	26-Sep-08	14:10:00	33.1	470.8	55	3.6	40.8	49	43	2	4	2	1	-2	-1	0	3	2	1	10	6	1	Manila	Phils	0.4	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
151	Deira	Summer	26-Sep-08	14:20:00	33.1	470.8	55	3.6	40.8	45	46.8	1.5	4	0	0	-1		1	4	2	13	10	1	1	Manila	Phils	2.5	0	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	0	
152	Deira	Summer	26-Sep-08	14:30:00	33.1	470.8	55	3.6	40.3	48	49.5	1	5	1	0	0	0	1	2	1	16	62	1	1	Yupi	India	19.0	1	20	2		3	1	1	0	0	0	0	0	0	0	0	cleaning ca
153	Deira	Summer	26-Sep-08	14:40:00	33.1	470.8	55	3.6	38.1	40	37.8	0.9	4	2	1	-2	-1	1	3	1	3	12	6	0	Cairo	Egypt	3.0	1	20	2		1	1	1	0	0	0	0	0	0	0	1	
154	Deira	Summer	26-Sep-08	14:50:00	33.1	470.8	55	3.6	37.5	44	54	0.7	3	0	1	0	-1	1	2	2	1	10	7	1	Lahore	Pakistan	20.0	1	20	3	better shading	2	1	1	0	0	0	0	0	0	0	0	
155	Deira	Summer	26-Sep-08	17:00:00	32.5	470.8	55	3.09	35.5	43	63.3	0.7	5	0	0	0	-1	1	3	1	1	10	0	0	Nueva Ecija	Phils	2.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
156	Deira	Summer	26-Sep-08	17:20:00	32.5	470.8	55	3.09	35.5	43	63.3	0.7	4	0	0	-1	-1	0	3	1	7	10	4	1	Kerala	India	2.0	0	20	3	AC bus stops	1	2	1	0	0	0	0	0	0	1	0	
157	Deira	Summer	26-Sep-08	17:25:00	32.5	470.8	55	3.09	36	42	61	0.7	4	0	0	0	0	1	3	2	1	10	7	1	Kerala	India	7.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
158	Deira	Summer	26-Sep-08	17:38:00	32.5	470.8	55	3.09	35.8	42	61	0.7	3	1	1	0	-1	0	2	2	3	53	0	0	Amman	Jordan	1.0	1	20	3	make waiting	2	2	2	0	0	0	0	0	0	1	0	shawl on h
159	Deira	Summer	26-Sep-08	17:38:00	32.5	470.8	55	3.09	35.8	42	61	0.7	4	1	1	0	-1	0	2	2	3	53	0	0	Amman	Jordan	1.0	1	20	3	make waiting	2	2	2	0	0	0	0	0	0	1	0	shawl on h
160	Deira	Summer	26-Sep-08	18:00:00	31.9	470.8	59	4.12	34.5	35	65.1	1	4	1		0	-1	0	2	3	1	10	7	1	Kerala	India	0.6	1	20	3	proper bus st	2	1	1	0	0	0	0	0	0	0	0	
161	Deira	Summer	26-Sep-08	18:10:00	31.9	470.8	59	4.12	34.5	35	65.1	2	2	0		0	0	1	3	2	1	22	5	1		India	5.0	1	10	2		3	1	3	0	0	0	0	0	0	0	0	
162	Deira	Summer	26-Sep-08	18:10:00	31.9	470.8	59	4.12	34.5	35	65.1	2	2	0		0	0	1	3	2	1	22	5	1		India	15.0	1	10	2		3	1	3	0	0	0	0	0	0	0	0	
163	Deira	Summer	26-Sep-08	18:10:00	31.9	470.8	59	4.12	34.5	35	65.1	2	2	0		0	0	1	3	2	1	22	5	1		India	15.0	1	10	2		3	1	3	0	0	0	0	0	0	0	0	
164	Deira	Summer	26-Sep-08	18:16:00	31.9	470.8	59	4.12	34.5	39	65.6	3	5	1		0	0	0	4	1	1	10	5	1	Cagayan de	Phils	1.0	0	20	3	plants	1	1	1	0	0	0	0	0	0	0	0	
165	Deira	Summer	26-Sep-08	18:31:00	31.9	470.8	59	4.12	34.5	39	65.6	3	4	0		-1	0	1	1	1	1	10	3	1	Kathmandu	Nepal	3.5	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
166	Deira	Summer	26-Sep-08	18:36:00	31.9	470.8	59	4.12	33.8	39	67.4	2	4	1		-1	-1	0	3	1	1	10	8	1	Kathmandu	Nepal	3.0	0	20	2	nicer weather	1	1	1	0	0	0	0	0	0	0	0	
167	Deira	Summer	26-Sep-08	18:38:00	31.9	470.8	59	4.12	33.8	40	67.8	1.8	5	0		0	-1	0	2	1	1	10	1	0	Goa	India	23.0	0	60	3	AC bus stops	2	2	2	0	0	0	0	0	0	0	0	
168	Deira	Summer	26-Sep-08	18:42:00	31.9	470.8	59	4.12	33.6	36	67.2	1.6	5	2		-1	0	1	3	3	17	11	7	1	Bombay	India	3.0	0	20	3		3	1	1	0	0	0	0	0	0	0	0	
169	Deira	Summer	26-Sep-08	18:45:00	31.9	470.8	59	4.12	33.2	35	69	1.2	4	1		-1	0	1	1	1	11	17	4	0	Bethleham	Palestine		0	20	3	nicer weather	1	1	1	0	1	0	0	0	0	0	0	smoking
170	Deira	Summer	26-Sep-08	18:55:00	31.9	470.8	59	4.12	32.9	39	69.4	1	4	0		-1	-1	1	3	3	12	11	0	0		Oman	0.0	1	51	3		3	1	4	0	0	0	0	0	0	0	1	
171	Deira	Summer	26-Sep-08	18:55:00	31.9	470.8	59	4.12	32.9	39	69.4	1	4	0		-1	-1	1	3	3	12	11	0	0		Oman	0.0	1	51	3		3	1	4	0	0	0	0	1	0	0	1	
172	Deira	Summer	26-Sep-08	18:55:00	31.9	470.8	59	4.12	32.9	39	69.4	1	4	0		-1	-1	1	3	3	12	11	0	0		Oman	0.0	1	51	3		3	1	4	0	0	0	0	0	0	0	1	
173	Deira	Summer	26-Sep-08	18:55:00	31.9	470.8	59	4.12	32.9	39	69.4	1	4	0		-1	-1	1	3	3	12	11	0	0		Oman	0.0	1	51	3		3	1	4	0	0	0	0	0	0	0	1	
174	Deira	Summer	26-Sep-08	18:55:00	31.9	470.8	59	4.12	32.9	39	69.4	1	4	0		-1	-1	1	3	3	12	11	0	0		Oman	0.0	1	51	3		3	1	4	0	0	0	0	0	0	0	1	

Survey Database: Summer – October 1, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
175	Satwa	Summer	1-Oct-08	8:00:00	36.5	452.7	35	4.63	32.2	29	68.4		3	1	1	0	0	0	1	3	1	10	8	1	Pampanga	Phils	0.3	0	51	3		2	2	1	0	0	0	0	0	0	0	0	
176	Satwa	Summer	1-Oct-08	8:05:00	36.5	452.7	35	4.63	32.2	29	68.4		4	0	0	0	0	1	2	1	1	10	5	0	Kerala	India	4.0	0	20	3	make bus sto	2	2	1	0	0	0	0	0	0	0	0	
177	Satwa	Summer	1-Oct-08	8:10:00	36.5	452.7	35	4.63	32.2	29	68.4		4	0	0	0	0	1	3	2	2	10	5	1	Dhaka	Bangladesh	2.5	1	20	2		2	1	1	0	0	0	0	0	0	0	0	
178	Satwa	Summer	1-Oct-08	8:15:00	36.5	452.7	35	4.63	32.2	29	68.4		4	0	0	0	0	1	1	3	1	10	8	1	Kathmandu	Nepal	2.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
179	Satwa	Summer	1-Oct-08	8:15:00	36.5	452.7	35	4.63	32.2	29	68.4		4	0	0	0	0	1	1	3	1	10	8	1	Kathmandu	Nepal	2.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
180	Satwa	Summer	1-Oct-08	8:20:00	36.5	452.7	35	4.63	32.3	32	69	1	5	0	0	0	0	1	2	1	1	10	6	1		Pakistan	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
181	Satwa	Summer	1-Oct-08	8:25:00	36.5	452.7	35	4.63	32.3	32	69	1	5	0	0	-2	0	0	2	2	1	10	7	1	Iloilo	Phils	0.5	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
182	Satwa	Summer	1-Oct-08	8:30:00	36.5	452.7	35	4.63	32.9	32	69	1	3	0	0	0	0	1	2	1	1	10	8	1	Pampanga	Phils	0.8	0	20	3		2	2	2	0	0	0	0	0	0	0	1	
183	Satwa	Summer	1-Oct-08	8:35:00	36.5	452.7	35	4.63	32.9	32	69	1	6	0	0	0	0	1	3	2	1	10	7	1	Goa	India	15.0	0	20	2		2	2	1	0	0	0	0	0	0	1	1	shawl on h
184	Satwa	Summer	1-Oct-08	8:40:00	36.5	452.7	35	4.63	32.9	32	69	1	5	0	0	0	0	1	2	3	1	10	8	1	Maharashtra	India	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
185	Satwa	Summer	1-Oct-08	8:55:00	36.5	452.7	35	4.63	35.2	34	61.8		4	0	0	0	0	1	3	1	1	10	6	0	General San	Phils	0.4	0	51	3	more buses	1	2	1	0	0	0	0	0	0	0	1	
186	Satwa	Summer	1-Oct-08	9:00:00	36.1	452.7	35	5.14	35.2	34	61.8		4	1	1	0	0	1	3	2	1	10	6	0	Butuan	Phils	0.1	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
187	Satwa	Summer	1-Oct-08	9:12:00	36.1	452.7	35	5.14	39.5	49	56.3		4	1	0	-2	0	0	3	2	16	19	0	0	Naga	Phils	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
188	Satwa	Summer	1-Oct-08	9:16:00	36.1	452.7	35	5.14	39.5	49	56.3		5	0	0	0	-1	1	1	2	3	11	6	1	Chennai	India	15.0	0	20	2		2	1	1	1	0	0	0	0	0	0	0	
189	Satwa	Summer	1-Oct-08	9:24:00	36.1	452.7	35	5.14	33.4	31	64.2		4	0	0	0	0	1	3	3	1	10	7	1	Alexandria	Egypt	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
190	Satwa	Summer	1-Oct-08	9:32:00	36.1	452.7	35	5.14	34.6	31	62.2		4	0	1	0	0	1	3	2	1	10	8	1	Gujarat	India	0.3	0	20	3	AC bus stops	2	2	1	0	0	0	0	0	0	0	0	
191	Satwa	Summer	1-Oct-08	9:39:00	36.1	452.7	35	5.14	34.4	33	61.6		5	0	0	0	-1	1	4	1	1	10	0	0	Kerala	India	12.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
192	Satwa	Summer	1-Oct-08	9:48:00	36.1	452.7	35	5.14	34.8	33	58.2		4	0	0	-1	0	1	3	2	1	10	7	1	Batangas	Phils	3.0	0	20	3		1	1	1	0	0	0	0	1	0	0	0	
193	Satwa	Summer	1-Oct-08	9:48:00	36.1	452.7	35	5.14	34.8	33	58.2		4	0	0	-1	0	1	3	2	1	10	7	1	Batangas	Phils	3.0	0	20	3		1	1	1	0	0	0	0	1	0	0	0	
194	Satwa	Summer	1-Oct-08	9:55:00	36.1	452.7	35	5.14	35.1	33	57.2		7	0	0	0	0	1	3	3	14	10	0	1	Laguna	Phils	25.0	1	20	3	more AC bus	2	1	1	0	0	0	0	0	0	0	1	
195	Satwa	Summer	1-Oct-08	12:30:00	35.0	452.7	39	6.17	40.8	30	48.2		3	2	0	-1	0	0	3	3	1	10	0	0	Batangas	Phils	0.5	0	20	3		2	1	3	0	0	0	0	1	0	0	1	
196	Satwa	Summer	1-Oct-08	12:30:00	35.0	452.7	39	6.17	40.8	30	48.2		3	2	0	-1	0	0	3	3	1	10	0	0	Batangas	Phils	0.5	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
197	Satwa	Summer	1-Oct-08	12:30:00	35.0	452.7	39	6.17	40.8	30	48.2		3	2	0	-1	0	0	3	3	1	10	0	0	Batangas	Phils	0.5	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
198	Satwa	Summer	1-Oct-08	12:30:00	35.0	452.7	39	6.17	40.8	30	48.2		3	2	0	-1	0	0	3	3	1	10	0	0	Batangas	Phils	0.5	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
199	Satwa	Summer	1-Oct-08	12:40:00	35.0	452.7	39	6.17	41.2	54	46		5	0	0	0	0	1	1	1	1	10	6	1	Bombay	India	20.0	0	20	3		2	1	1	1	0	0	0	1	0	0	1	
200	Satwa	Summer	1-Oct-08	12:50:00	35.0	452.7	39	6.17	42.2	54	50.6		4	0	0	0	0	1	5	3	1	10	7	1	Kerala	India	0.2	0	20	3	proper AC bu	2	1	1	1	0	0	0	0	0	0	0	
201	Satwa	Summer	1-Oct-08	12:55:00	35.0	452.7	39	6.17	41.2	38	50		4	0	0	-1	0	0	4	1	1	10	6	1	Pampanga	Phils	0.7	0	20	3	AC bus stops	1	2	1	0	0	0	0	0	0	0	0	with fan
202	Satwa	Summer	1-Oct-08	12:58:00	35.0	452.7	39	6.17	42	54	49.5		4	0	0	0	-1	1	2	2	2	10	5	1	Bombay	India	1.0	0	20	3	more nos. of	2	1	1	1	0	0	0	0	0	0	1	
203	Satwa	Summer	1-Oct-08	13:00:00	34.2	452.7	41	5.66	37.5	34	50.6		4	2	1	-2	-1	0	5	1	15	10	0	0	Baguio	Phils	0.4	0	20	3	faster means	1	2	3	0	0	0	0	0	0	0	0	
204	Satwa	Summer	1-Oct-08	13:17:00	34.2	452.7	41	5.66	36.3	32	42.9		4	0	0	0	0	1	3	1	1	10	7	1	Cabanatuan	Phils	1.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
205	Satwa	Summer	1-Oct-08	13:17:00	34.2	452.7	41	5.66	36.3	32	42.9		4	0	0	0	0	1	3	1	1	10	7	1	Cavite	Phils	1.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
206	Satwa	Summer	1-Oct-08	13:17:00	34.2	452.7	41	5.66	36.3	32	42.9		4	2	0	0	0	0	3	1	1	10	7	0	Kyrzstan	Russia	0.1	0	51	3		1	1	3	0	0	0	0	0	0	0	0	
207	Satwa	Summer	1-Oct-08	13:17:00	34.2	452.7	41	5.66	36.3	32	42.9		3	2	0	-1	0	0	3	1	1	10	7	0	Kyrzstan	Russia	0.1	0	51	3		1	1	3	0	0	0	0	0	0	0	0	
208	Satwa	Summer	1-Oct-08	13:27:00	34.2	452.7	41	5.66	37.7	31	43.5		4	1	1	-1	-1	1	3	1	1	10	8	1	Peshawar	Pakistan	12.0	0	20	2		1	1	2	0	0	0	0	0	0	0	0	sitting unde
209	Satwa	Summer	1-Oct-08	13:27:00	34.2	452.7	41	5.66	37.7	31	43.5		3	1	1	-1	-1	1	3	1	1	10	7	1	Peshawar	Pakistan	0.5	0	51	2		1	1	2	0	0	0	0	0	0	0	0	sitting unde
210	Satwa	Summer	1-Oct-08	13:32:00	34.2	452.7	41	5.66	37.7	31	43.5		4	0	0	0	0	1	3	2	11	10	1	1	Chennai	India	11.0	0	20	3	bigger AC bu	2	1	1	0	0	0	0	0	0	0	0	
211	Satwa	Summer	1-Oct-08	13:37:00	34.2	452.7	41	5.66	38	35	48.1		4	2	1	-1	-1	0	4	2	1	10	0	1	Quezon City	Phils	1.0	0	20	3	more efficient	2	1	1	0	0	0	0	0	0	0	1	
212	Satwa	Summer	1-Oct-08	13:40:00	34.2	452.7	41	5.66	41.9	58	48		4	0	0	0	0	1	2	3	16	10	7	1	Kanataka	India	3.0	0	20	2		2	1	1	1	0	0	0	0	0	0	0	
213	Satwa	Summer	1-Oct-08	14:00:00	32.9	452.7	53	5.14	38.2	33	38		3	0	1	0	0	1	5	3	12	14	0	0		Germany	0.0	0	51	3		1	1	2	0	1	0	1	0	0	0	0	sitting & ea
214	Satwa	Summer	1-Oct-08	14:00:00	32.9	452.7	53	5.14	38.2	33	38		3	0	1	0	0	1	5	3	12	14	0	0		Germany	0.0	0	51	3		1	1	2	0	1	0	1	0	0	0	0	sitting & ea
215	Satwa	Summer	1-Oct-08	17:11:00	32.4	452.7	56	2.06	35.2	43	60.1		4	0	0	0	-1	1	1	1	2	10	8	1	Kerala	India	12.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
216	Satwa	Summer	1-Oct-08	17:19:00	32.4	452.7	56	2.06	34.7	42	63.1		3	0	0.5	-1	-1	1	3	1	1	10	0	1	Bulacan	Phils	0.3	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
217	Satwa	Summer	1-Oct-08	17:24:00	32.4	452.7	56	2.06	34.5	37	64		4	0	0	-2	0	1	2	1	1	10	3	1	Cebu	Phils	1.2	0	20	3	a working AC	1	2	1	0	0	0	0	0	0	0	1	
218	Satwa	Summer	1-Oct-08	17:27:00	32.4	452.7	56	2.06	34.5	37	64		4	1	0	-1	-1	1	4	1	1	10	7	1	Bulacan	Phils	5.0	0	20	3	a working AC	1	1	1	0	0	0	0	0	0	0	1	
219	Satwa	Summer	1-Oct-08	17:34:00	32.4	452.7	56	2.06	34.5	40	65.1		4	0	0	0	0	0	5	1	1	10	8	1	Hyderabad	India	10.0	0	20	3	frequent trans	1	1	1	0	0	0	0	0	0	0	0	
220	Satwa	Summer	1-Oct-08	17:39:00	32.4	452.7	56	2.06	33.5	40	68		6	1		0	0	1	2	1	16	10	8	1	Punjab	India	15.0	0	20	3		2	1	1	0	0	0	0	0	1	0	1	
221	Satwa	Summer	1-Oct-08	17:40:00	32.4	452.7	56	2.06	33.3	39	68.4		5	0		0	0	1	3	2	2	10	8	1	Chennai	India	1.5	0	20	3	more buses	2	1	1	0	0	0	0	0	0	0	0	
222	Satwa	Summer	1-Oct-08	17:45:00	32.4	452.7	56	2.06	33.2	43	68.8		3	0		0	0	1	2	1	2	10	2	0	Bombay	India	0.2	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
223	Satwa	Summer	1-Oct-08	17:55:00	32.4	452.7	56	2.06	33.2	43	68.8		7	0		0	-1	1	4	2	1	10	7	0	Goa	India	6.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
224	Satwa	Summer	1-Oct-08	18:00:00	31.7	452.7	63	2.57	33.5	39	69.1		2	1		-1	-1	1	5	3	1	19	7	1	Kerala	India	14.0	0	51	2	entertainment	2	1	3	0	0	0	0	0	0	0	0	
225	Satwa	Summer	1-Oct-08	18:00:00	31.7	452.7	63	2.57	33.5	39	69.1		2	1		0	-1	1	3	3	1	10	7	1	Kerala	India	16.0	0	10	2		2	2	3	0	0	0	0	0	0	0	0	
226	Satwa	Summer	1-Oct-08	18:00:00	31.7	452.7	63	2.57	33.5	39	69.1		2	1		0	-1	1	3	3	1	19	7	1	Kerala	India	16.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
227	Satwa	Summer	1-Oct-08	18:00:00	31.7	452.7	63	2.57	33.5	39	69.1		2	0		0	0	1	3	3	1	10	7	1	Kerala	India	16.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
228	Satwa	Summer	1-Oct-08	18:00:00	31.7	452.7	63	2.57	33.5	39	69.1		2	0		0	0	1	3	3	1	10	7	1	Kerala	India	16.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
229	Satwa	Summer	1-Oct-08	18:10:00	31.7	452.7	63	2.57	32.8	38	70.4		4	0		-2	-1	0	4	2	1	10	6	1		Kenya	3.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
230	Satwa	Summer	1-Oct-08	18:10:00	31.7	452.7	63	2.57	32.8	38	70.4		3	0		-2	-1	0	4	2	1	10	6	1		Kenya	1.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
231	Satwa	Summer	1-Oct-08	18:17:00	31.7	452.7	63	2.57	32.9	27	70		5	0		-2	-1	0	3	2	2	10	2	0	Punjab	India	11.0	0	56	2		2	1	2	0	0	0	0	0	1	0	0	
232	Satwa	Summer	1-Oct-08	18:24:00	31.7	452.7	63	2.57	32.6	32	70.6		4	0		-1	1	1	5	2	61	10	8	1	Colombo	Sri Lanka	0.8	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
233	Satwa	Summer	1-Oct-08	18:29:00	31.7	452.7	63	2.57	32.6	41	70.2		3	1		0	-1	1	2	2	2	10	0	0	Yangoon	Myanmar	0.6	0	20	3		2	0	1	0	0	0	0	0	0	0	0	
234	Satwa	Summer	1-Oct-08	18:35:00	31.7	452.7	63	2.57	32.4	41	71.1		3	1		-1	0	0	3	1	2	10	0	0	Maharashtra	India	1.5	0	20	3	get the Metro	1	1	1	0	0	0	0	0	0	0	0	

Survey Database: Autumn – November 18, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
235	SZR	Autumn	18-Nov-08	7:40:00	27.3	439.8	38	2.06	21.5	27	60.8	0.9	4	0	0	-1	0	1	3	2	1	10	5	0	Peshawar	Pakista	2.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
236	SZR	Autumn	18-Nov-08	7:48:00	27.3	439.8	38	2.06	22	21	59.8	0.9	4	0	0	-1	0	1	4	3	1	10	4	0	Kerala	India	4.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
237	SZR	Autumn	18-Nov-08	7:51:00	27.3	439.8	38	2.06	22.8	23	58.3	1.1	5	-1	0	1	1	1	2	1	1	10	6	1	Pasig	Philippines	1.2	0	20	2	don't demolish	1	1	2	0	0	0	0	0	0	0	0	
238	SZR	Autumn	18-Nov-08	8:01:00	27.1	439.8	42	3.09	22.8	25	58	0.9	3	0	0	-1	-1	1	3	1	1	10	6	1	Antipolo	Philippines	1.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
239	SZR	Autumn	18-Nov-08	8:06:00	27.1	439.8	42	3.09	23.2	22	58.3	0.4	6	-1	0	1	0	1	2	3	1	10	6	1	Pampanga	Philippines	0.8	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
240	SZR	Autumn	18-Nov-08	8:12:00	27.1	439.8	42	3.09	23.5	23	57	0.2	3	0	0	0	0	1	2	2	1	10	6	1	Olongapo	Philippines	1.0	0	20	3	more buses	2	1	2	0	0	0	0	0	0	0	0	
241	SZR	Autumn	18-Nov-08	8:12:00	27.1	439.8	42	3.09	23.5	23	57	0.2	3	0	0	0	0	1	2	2	1	10	6	1	Bulacan	Philippines	6.0	0	20	2	more buses	2	1	2	0	0	0	0	0	0	0	0	
242	SZR	Autumn	18-Nov-08	8:18:00	27.1	439.8	42	3.09	23.8	23	56.8	0.4	4	0	0	0	1	1	3	2	9	10	4	1	Mumbai	India	1.5	0	20	2	more means	2	1	1	0	0	0	0	0	0	0	0	
243	SZR	Autumn	18-Nov-08	8:28:00	27.1	439.8	42	3.09	22.5	27	60.5	0.2	5	-1	0	0	-1	1	3	1	1	20	3	0	Cardiff	United Kingd	0.3	0	20	3	some places	1	2	1	0	0	0	0	0	0	0	0	
244	SZR	Autumn	18-Nov-08	8:36:00	27.1	439.8	42	3.09	22.5	22	60.2	0.2	5	0	0	0	0	1	5	3	5	20	5	1	Dubai	UAE	30.0	0	20	3	shading, umb	2	1	1	0	0	0	0	1	0	0	1	
245	SZR	Autumn	18-Nov-08	8:42:00	27.1	439.8	42	3.09	23.2	24	58.7	0.7	6	1	0	0	0	1	3	2	1	10	5	1	Kerala	India	6.0	0	20	3	make AC bus	2	1	1	0	0	0	0	0	0	0	0	
246	SZR	Autumn	18-Nov-08	8:50:00	27.1	439.8	42	3.09	24.3	24	57.8	0.2	6	1	0	0	1	1	1	1	2	20	8	1	Colombo	Sri Lanka	16.0	0	20	3	ok	2	1	1	0	0	0	0	0	0	0	1	
247	SZR	Autumn	18-Nov-08	9:01:00	27.3	439.8	43	4.63	24.9	23	58.6	0.3	5	0	0	0	0	1	3	1	1	10	5	1		India	3.0	0	20	2		1	1	2	0	0	0	0	0	0	0	0	
248	SZR	Autumn	18-Nov-08	9:01:00	27.3	439.8	43	4.63	24.9	23	58.6	0.3	5	0	0	0	0	1	3	1	1	10	5	1		India	2.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
249	SZR	Autumn	18-Nov-08	9:10:00	27.3	439.8	43	4.63	25	25	58.2	1	6	0	0	0	0	1	5	2	1	10	0	0	Mindoro	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
250	SZR	Autumn	18-Nov-08	9:25:00	27.3	439.8	43	4.63	26.3	25	55	0.2	4	0	0	0	1	1	3	1	2	10	6	0	Nairobi	Kenya	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
251	SZR	Autumn	18-Nov-08	9:46:00	27.3	439.8	43	4.63	30.2	32	44.7	0	4	0	1	0	0	0	3	1	1	10	1	0	Manila	Philippines	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
252	SZR	Autumn	18-Nov-08	9:51:00	27.3	439.8	43	4.63	28.6	27	43.5	0.7	4	0	1	1	0	0	2	2	1	20	6	0	Tripoli	Lebanon	8.0	0	20	3	enclose the c	2	1	2	0	0	0	0	0	0	0	0	smoking
253	SZR	Autumn	18-Nov-08	12:39:00	27.0	439.8	37	4.63	27.8	30	48.2	0	5	0	0	-1	0	1	1	1	2	12	8	0		Saudi Arabia	10.0	0	20	3		1	1	1	0	0	0	0	0	1	0	0	
254	SZR	Autumn	18-Nov-08	12:25:00	27.0	439.8	37	4.63	37.7	47	41.5	0.3	6	1	0	0	1	1	2	1	4	12, 20	5	0	Calcutta	India	2.0	0	20	3	make AC bus	1	1	1	1	0	0	0	0	0	0	1	
255	SZR	Autumn	18-Nov-08	13:06:00	26.4	439.8	39	3.6	27.2	30	48.3	1.7	5	0	0	1	0	1	3	1	2	12	8	1	Manila	Philippines	4.0	0	20	3	places to unw	1	1	2	0	0	0	0	0	0	0	1	
256	SZR	Autumn	18-Nov-08	13:06:00	26.4	439.8	39	3.6	27.2	30	48.3	1.7	5	0	0	1	0	1	3	1	2	12	8	1	Manila	Philippines	10.0	0	20	3	places to unw	1	1	2	0	0	0	0	0	0	0	1	
258	SZR	Autumn	18-Nov-08	13:17:00	26.4	439.8	39	3.6	34.3	48	44	1.1	4	0	-1	1	0	1	2	1	2	12	8	1	Manila	Philippines	2.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	with tie
259	SZR	Autumn	18-Nov-08	13:41:00	26.4	439.8	39	3.6	33	46	42.8	1.1	4	0	0	0	0	1	3	2	2	11	6	1	Delhi	India	4.5	0	20	3		3	1	1	1	0	0	0	0	0	0	0	
260	SZR	Autumn	18-Nov-08	13:45:00	26.4	439.8	39	3.6	34.6	45	40	0.3	4	0	0	0	0	1	1	3	2	13	8	1		Pakistan	1.5	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
261	SZR	Autumn	18-Nov-08	13:45:00	26.4	439.8	39	3.6	34.6	45	40	0.3	4	0	0	0	0	1	1	3	2	13	8	1		Egypt	1.5	0	20	3		2	1	3	0	0	0	0	0	0	0	1	with tie
262	SZR	Autumn	18-Nov-08	13:45:00	26.4	439.8	39	3.6	34.6	45	40	0.3	4	0	0	0	0	1	1	3	2	13	8	1		Egypt	1.0	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
263	SZR	Autumn	18-Nov-08	13:49:00	26.4	439.8	39	3.6	33	33	41.1	0.8	4	0	0	0	0	1	2	1	2	11	1	1	Eindhoven	Holland	1.0	0	20	3		3	1	1	1	0	0	0	0	0	0	1	with tie
264	SZR	Autumn	18-Nov-08	13:56:00	26.4	439.8	39	3.6	29.4	41	43.5	0.8	4	0	0	0	0	1	3	2	2	18	5	1	Hyderabad	India	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
265	SZR	Autumn	18-Nov-08	14:13:00	25.9	439.8	37	3.6	29.8	40	42.2	0.5	4	0	0	0	0	1	1	1	4	19	8	1	Cairo	Egypt	2.0	0	20	3	smoking area	2	1	3	0	0	0	0	0	0	0	0	
266	SZR	Autumn	18-Nov-08	14:13:00	25.9	439.8	37	3.6	29.8	40	42.2	0.5	4	0	0	0	0	1	1	1	4	19	8	1	Amman	Jordan	0.5	0	20	3	smoking area	2	1	3	0	0	0	0	0	0	0	0	
267	SZR	Autumn	18-Nov-08	14:13:00	25.9	439.8	37	3.6	29.8	40	42.2	0.5	4	0	0	0	0	1	1	1	4	19	8	1	Tripoli	Lebanon	2.0	0	20	3	smoking area	2	1	3	0	0	0	0	0	0	0	0	
268	SZR	Autumn	18-Nov-08	14:23:00	25.9	439.8	37	3.6	29.2	33	43.2	1.5	4	0	0	0	0	1	1	1	6	1	0	1	Abu Dhabi	UAE	25.0	0	20	2		2	1	1	0	0	0	0	0	1	0	0	smoking
269	SZR	Autumn	18-Nov-08	14:31:00	25.9	439.8	37	3.6	30	33	43.2	0.5	4	0	1	0	0	1	3	1	4	10	1	1	Pasig	Philippines	1.5	0	20	3	trees	1	2	1	0	0	0	0	0	0	0	0	
257	SZR	Autumn	18-Nov-08	14:40:00	25.9	439.8	37	3.6	29.6	38	44.5	1.1	4	0	0	0	0	1	1	1	2	13, 15	8	1	Mumbai	India	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
270	SZR	Autumn	18-Nov-08	17:51:00	25.3	439.8	46	1.03	27.3	28.6	44.8	0	5	0		0	1	1	3	2	2	20	8	0	Zahly	Lebanon	8.0	0	20	3	flowers, plants	1	1	1	0	0	0	0	0	0	0	0	smoking
271	SZR	Autumn	18-Nov-08	17:58:00	25.3	439.8	46	1.03	27.7	29	45.7	0.2	4	0		0	0	1	3	1	2	10	5	1	Karachi	Pakistan	7.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
272	SZR	Autumn	18-Nov-08	18:04:00	25.2	439.8	47	3.09	28	32	46.2	0.2	4	0		0	0	1	3	2	2	10	0	0	Chittagong	Bangladesh	6.0	0	20	2		2	1	1	0	1	0	0	0	0	0	0	smoking
273	SZR	Autumn	18-Nov-08	18:09:00	25.2	439.8	47	3.09	24.4	22	52.3	1.4	4	0		0	0	1	1	1	2	10	8	1	Muntinlupa	Philippines	1.0	0	20	3	more seats	2	2	1	0	0	0	0	0	0	0	0	
274	SZR	Autumn	18-Nov-08	18:12:00	25.2	439.8	47	3.09	30.7	29	46.8	1	4	0		0	0	1	2	1	2	10	5	0	Nueva Ecija	Philippines	3.0	0	20	3	more buses	1	2	1	0	0	0	0	0	0	0	0	
275	SZR	Autumn	18-Nov-08	18:20:00	25.2	439.8	47	3.09	26.3	25	46.6	2	4	0		1	0	1	3	1	2	10	5	1	Kerala	India	2.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	smoking
276	SZR	Autumn	18-Nov-08	18:26:00	25.2	439.8	47	3.09	25.9	26	49.2	0.2	4	0		0	1	1	3	1	1	10	5	1	Kerala	India	0.0	0	51	3		1	1	1	0	0	0	0	0	0	0	1	
277	SZR	Autumn	18-Nov-08	18:30:00	25.2	439.8	47	3.09	26.3	26	52.4	0.2	4	0		0	0	1	5	2	5	15	5	0		Lebanon	4.0	0	20	3		1	2	1	0	0	0	0	0	0	1	0	shawl on h
278	SZR	Autumn	18-Nov-08	18:35:00	25.2	439.8	47	3.09	26.5	26	50.6	0.2	4	-1		0	0	1	3	1	2	15	5	1	Kerala	India	0.5	0	20	3	plants	2	1	1	0	0	0	0	0	0	1	0	shawl on s
279	SZR	Autumn	18-Nov-08	18:43:00	25.2	439.8	47	3.09	26.7	31	48.6	0.3	5	0		0	0	1	1	1	2	11	8	1		India	14.0	0	20	3		3	1	1	0	0	0	0	1	0	0	1	
280	SZR	Autumn	18-Nov-08	18:57:00	25.2	439.8	47	3.09	28.5	28	47.8	0.5	5	0		0	0	1	5	2	11	10	0	0	Kerala	India	6.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
281	SZR	Autumn	18-Nov-08	18:57:00	25.2	439.8	47	3.09	28.5	28	47.8	0.5	6	0		0	0	1	5	2	11	10	0	0	Kerala	India	12.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
282	SZR	Autumn	18-Nov-08	19:02:00	24.5	439.8	45	1.54	28.5	28	47.8	0.8	2	0		0	0	1	4	2	11	10	2	1	Beirut	Lebanon	0.3	0	10	3		1	1	1	0	0	0	0	0	0	0	0	
283	SZR	Autumn	18-Nov-08	19:22:00	24.5	439.8	45	1.54	26.7	29	48	0.3	3	0		1	0	1	2	2	2	10	3	0	Taguig	Philippines	1.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
284	SZR	Autumn	18-Nov-08	19:27:00	24.5	439.8	45	1.54	27.4	31	48	0.3	3	-1		0	0	1	3	2	2	10	0	0	Tondo	Philippines	0.3	0	20	3	television	1	2	1	0	0	0	0	0	0	0	0	
285	SZR	Autumn	18-Nov-08	19:33:00	24.5	439.8	45	1.54	27.4	31	48	0.3	6	0		0	0	1	3	3	2	10	0	1	Laguna	Philippines	4.0	0	20	3	better pedest	1	1	1	0	0	0	0	0	0	0	0	
286	SZR	Autumn	18-Nov-08	20:06:00	23.6	439.8	48	2.57	26.5	28	50.3	3.4	3	0		-1	0	1	3	1	5	20	7	1	Chennai	India	3.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
287	SZR	Autumn	18-Nov-08	20:06:00	23.6	439.8	48	2.57	26.5	28	50.3	3.4	3	0		-1	0	1	3	1	5	20	7	1	Hyderabad	India	3.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	

Survey Database: Autumn – November 19, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sun glasses	Other notes
288	Deira	Autumn	19-Nov-08	7:47:00	26.9	452.9	34	4.12	23.4	21	53.2	1.4	4	-1	0	1	0	1	1	2	1	10	5	1	Bohol	Philippines	2.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
289	Deira	Autumn	19-Nov-08	8:05:00	28.3	452.9	28	3.6	24.5	19	52.8	0.6	5	-1	0	1	0	1	1	1	1	10	6	1	Manila	Philippines	6.0	0	20	3	change waitin	2	1	1	0	0	0	0	0	0	0	1	
290	Deira	Autumn	19-Nov-08	8:10:00	28.3	452.9	28	3.6	24.5	19	52.8	0.6	5	0	0	0	1	1	3	1	1	10	8	1	Kandi	Sri Lanka	1.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	smoking
291	Deira	Autumn	19-Nov-08	8:15:00	28.3	452.9	28	3.6	24.5	19	52.8	0.6	5	0	0	0	0	1	3	1,3	1	10	0	1	Caloocan	Philippines	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
292	Deira	Autumn	19-Nov-08	8:19:00	28.3	452.9	28	3.6	24.5	19	52.8	0.6	5	0	0	0	0	1	2	3	1	10	7	0	Cairo	Egypt	1.0	0	20	3		2	1	1	0	1	0	0	0	0	0	0	smoking
293	Deira	Autumn	19-Nov-08	8:25:00	28.3	452.9	28	3.6	24.4	22	52.3	1.4	4	0	0	0	0	1	3	2	1	10	8	1	Peshawar	Pakistan	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
294	Deira	Autumn	19-Nov-08	8:34:00	28.3	452.9	28	3.6	30.7	29	26.8	1	4	0	0	0	0	1	2	3	1	15	5	1	Cairo	Egypt	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	behind sha
295	Deira	Autumn	19-Nov-08	8:38:00	28.3	452.9	28	3.6	37.7	28	41	1	4	0	0	0	0	1	1	2	2	19	6	0	Dhaka	Bangladesh	7.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
296	Deira	Autumn	19-Nov-08	8:43:00	28.3	452.9	28	3.6	27.7	25	48.6	0.8	5	0	0	1	1	1	3	3	1	10	4	1	Makati	Philippines	1.8	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
297	Deira	Autumn	19-Nov-08	8:50:00	28.3	452.9	28	3.6	28	27	45.1	0.5	4	0	1	1	-1	1	3	2	1	10	5	1	Damascus	Syria	0.6	0	20	3		2	1	1	0	0	0	0	0	0	0	1	with tie
298	Deira	Autumn	19-Nov-08	8:56:00	28.3	452.9	28	3.6	28	27	45.1	0.5	3	0	0	-1	0	1	2	1	2	10	6	1	UP	India	1.0	0	20	3	plants	2	1	1	0	0	0	0	0	0	0	0	with tie
299	Deira	Autumn	19-Nov-08	9:00:00	28.7	452.9	25	5.66	27.6	25	45.9	2.7	6	0	1	-1	-1	1	3	1	9	20	0	1	Manila	Philippines	1.0	0	20	3		2	1	1	0	0	0	0	1	0	0	1	
300	Deira	Autumn	19-Nov-08	10:00:00	27.9	452.9	41	6.17	29	25	44.5	0	4	0	0	0	0	1	3	1,2	2	10	3	0	Kerala	India	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
301	Deira	Autumn	19-Nov-08	10:13:00	27.9	452.9	41	6.17	28.5	25	45.1	0.2	3	-1	0	0	0	1	1	1	1	15	2	1	Manila	Philippines	0.3	0	20	3	proper waiting	1	1	1	0	0	0	0	0	0	0	1	
302	Deira	Autumn	19-Nov-08	10:23:00	27.9	452.9	41	6.17	28.5	28	46.8	1.2	4	0	0	0	0	1	3	1	1	10	4	0	Dhaka	Bangladesh	0.2	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
303	Deira	Autumn	19-Nov-08	10:23:00	27.9	452.9	41	6.17	28.5	20	42.2	1.2	6	0	0	0	1	1	3	3	6	10	1	1	Nueva Ecija	Philippines	0.4	0	20	2		1	1	2	0	0	0	0	1	0	0	0	
304	Deira	Autumn	19-Nov-08	10:23:00	27.9	452.9	41	6.17	28.5	20	42.2	1.2	5	0	0	0	1	1	5	1	8	10	1	1	Cavite	Philippines	4.0	0	20	3		1	1	2	0	0	0	0	1	0	0	0	
305	Deira	Autumn	19-Nov-08	10:43:00	27.9	452.9	41	6.17	28.5	20	42.2	1.2	4	-1	0	0	0	0	5	2	1	10	0	1	Pampanga	Philippines	3.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	smoking
306	Deira	Autumn	19-Nov-08	10:46:00	27.9	452.9	41	6.17	28.5	21	39.2	0.7	4	0	0	0	0	1	2	2	2	10	3	1	Kerala	India	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
307	Deira	Autumn	19-Nov-08	10:53:00	27.9	452.9	41	6.17	28.5	21	39.2	0.7	4	0	0	0	0	1	3	1	2	20	8	0	Kerala	India	10.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
308	Deira	Autumn	19-Nov-08	12:47:00	27.5	452.9	40	6.17	29.6	36	42.5	1.1	4	0	0	0	0	1	1	1	2	10	6	1	Kathmandu	Nepal	2.0	0	20	3	AC	2	2	1	0	0	0	0	0	0	0	1	
309	Deira	Autumn	19-Nov-08	12:55:00	27.5	452.9	40	6.17	29.6	36	42.5	1.1	4	0	1	0	0	1	4	3	2	10	0	1	Islamabad	Pakistan	2.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	refers to la
310	Deira	Autumn	19-Nov-08	13:00:00	27.0	452.9	39	5.66	29.7	32	43	2	6	0	1	0	0	1	4	2	2	10	0	1	Calicut	India	13.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
311	Deira	Autumn	19-Nov-08	13:04:00	27.0	452.9	39	5.66	29.7	36	43.6	2.3	4	0	0	0	0	1	2	2	2	10	5	0	Chennai	India	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
312	Deira	Autumn	19-Nov-08	13:08:00	27.0	452.9	39	5.66	29.7	36	43.6	2.3	3	0	0	0	0	1	2	2	1	10	6	1	Cavite	Philippines	2.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
313	Deira	Autumn	19-Nov-08	13:08:00	27.0	452.9	39	5.66	29.7	36	43.6	2.3	3	0	0	0	0	1	2	2	1	10	6	1	Cavite	Philippines	2.0	0	20	2		2	1	2	0	0	0	0	1	0	0	1	
314	Deira	Autumn	19-Nov-08	13:15:00	27.0	452.9	39	5.66	29.9	34	45.1	0.7	4	0	0	0	0	1	2	2	1	10	2	0	Kerala	India	6.0	0	20	3	plants / trees	2	1	1	0	0	0	0	0	0	0	0	
315	Deira	Autumn	19-Nov-08	13:21:00	27.0	452.9	39	5.66	29.9	34	45.1	0.7	5	0	0	0	0	1	3	3	1	15	6	0	Pampanga	Philippines	0.1	0	52	2	plants	2	1	1	0	0	0	0	0	0	0	0	
316	Deira	Autumn	19-Nov-08	13:26:00	27.0	452.9	39	5.66	28.8	43	43.7	3.1	5	0	0	0	-1	1	3	2	1	10	6	1	Bombay	India	1.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
317	Deira	Autumn	19-Nov-08	13:34:00	27.0	452.9	39	5.66	29.2	38	44.2	0.6	3	0	0	0	0	1	5	3	5	10	2	0	Karachi	Pakistan	0.1	0	52	3		2	1	1	0	0	0	0	0	0	0	0	with tie
318	Deira	Autumn	19-Nov-08	13:42:00	27.0	452.9	39	5.66	29.6	33	46.8	1.7	4	0	0	1	0	1	5	1	3	10	8	0	Colombo	Sri Lanka	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
319	Deira	Autumn	19-Nov-08	13:46:00	27.0	452.9	39	5.66	29.6	33	46.8	1.7	4	0	0	0	0	1	2	3	1	10	6	1	Quezon City	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	smoking
320	Deira	Autumn	19-Nov-08	14:05:00	26.7	452.9	39	5.14	29	28	45.7	0.6	4	0	0	0	0	1	2	1	2	12	6	1	Kerala	India	0.8	0	20	3	more plants &	1	1	1	0	0	0	0	0	0	0	0	
321	Deira	Autumn	19-Nov-08	14:33:00	26.7	452.9	39	5.14	29	28	45.7	0.6	4	0	0	0	0	1	3	1	9	10	0	1	Zamboanga	Philippines	0.5	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
322	Deira	Autumn	19-Nov-08	14:20:00	26.7	452.9	39	5.14	28.4	31	51	1.4	3	0	0	0	0	1	2	1	6	10	0	1	Nairobi	Kenya	0.2	0	10	3	more seats	2	2	1	0	0	0	0	0	0	0	0	
323	Deira	Autumn	19-Nov-08	14:26:00	26.7	452.9	39	5.14	28.4	31	51	1.4	5	0	0	0	0	1	5	2	2	10	0	1	Batangas	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
324	Deira	Autumn	19-Nov-08	14:30:00	26.7	452.9	39	5.14	29.9	31	44	0.9	7	0	1	1	0	0	4	2	3	10	0	0	Bombay	India	30.0	0	20	3	proper AC bu	2	1	1	1	0	0	0	0	0	0	1	
325	Deira	Autumn	19-Nov-08	14:35:00	26.7	452.9	39	5.14	29.6	32	47.3	1.7	4	0	0	1	0	1	3	2	1	10	7	1		Philippines	5.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
326	Deira	Autumn	19-Nov-08	14:40:00	26.7	452.9	39	5.14	28.5	30	46.1	0.9	3	0	0	0	0	1	5	3	2	10	8	0	Karachi	Pakistan	0.1	0	20	3	better public t	2	1	2	0	0	0	0	0	0	0	0	
327	Deira	Autumn	19-Nov-08	14:40:00	26.7	452.9	39	5.14	28.5	30	46.1	0.9	4	0	0	0	0	1	5	3	2	10	8	0	Karachi	Pakistan	0.1	0	20	3	better public t	2	1	2	0	0	0	0	0	0	0	0	
328	Deira	Autumn	19-Nov-08	17:23:00	25.2	452.9	39	4.12	26.7	21	44.3	0.2	4	0	0	0	1	1	3	1	1	10	6	0	Pateros	Philippines	7.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
329	Deira	Autumn	19-Nov-08	17:33:00	25.2	452.9	39	4.12	27.2	32	44	0.8	4	0		0	0	1	3	1	1	10	4	1	Bombay	India	0.7	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
330	Deira	Autumn	19-Nov-08	17:33:00	25.2	452.9	39	4.12	27.2	32	44	0.8	4	0		0	0	1	3	1	1	10	4	1	Hyderabad	India	0.7	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
331	Deira	Autumn	19-Nov-08	17:37:00	25.2	452.9	39	4.12	27.6	32	44	1.5	4	0		0	0	1	3	3	2	10	0	0	Kerala	India	1.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
332	Deira	Autumn	19-Nov-08	17:43:00	25.2	452.9	39	4.12	27.4	30	44.5	1.8	6	0		0	0	1	2	3	1	10	0	1	Pangasinan	Philippines		0	20	3		2	1	1	0	0	0	0	0	0	0	0	
333	Deira	Autumn	19-Nov-08	17:49:00	25.2	452.9	39	4.12	27	31	44.4	1.6	4	0		0	0	1	3	2	2	10	7	0	Kerala	India	0.3	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
334	Deira	Autumn	19-Nov-08	17:52:00	25.2	452.9	39	4.12	27.5	28	44	2	4	0		-1	0	1	1	1	1	10	6	1		India	24.0	0	20	3		2	2	1	0	0	0	0	0	0	1	0	shawl on s
335	Deira	Autumn	19-Nov-08	17:59:00	25.2	452.9	39	4.12	27.9	30	44.5	1.3	4	0		0	0	1	3	3	2	10	6	0	Laguna	Philippines	0.5	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
336	Deira	Autumn	19-Nov-08	17:59:00	25.2	452.9	39	4.12	27.9	30	44.5	1.3	3	0		0	0	1	3	3	2	10	6	0	Bulacan	Philippines	0.3	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
337	Deira	Autumn	19-Nov-08	18:04:00	24.1	452.9	38	4.12	27.7	30	44.6	0.8	3	-1		0	0	0	3	2	2	10	6	1	Pangasinan	Philippines	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
338	Deira	Autumn	19-Nov-08	18:11:00	24.1	452.9	38	4.12	27.2	28	45.6	0.8	5	0		0	0	1	2	2	6	20	0	0	Copenhagen	Denmark	0.0	0	51	3		3	2	1	0	0	0	0	0	0	0	0	
339	Deira	Autumn	19-Nov-08	18:17:00	24.1	452.9	38	4.12	27.2	28	45.6	0.8	5	0		0	0	1	3	1	2	15	8	1	Bangladesh	Dhaka	14.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
340	Deira	Autumn	19-Nov-08	18:24:00	24.1	452.9	38	4.12	27.8	29	45.8	0.3	5	0		-2	0	1	5	1	2	10	0	1	Cairo	Egypt	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
341	Deira	Autumn	19-Nov-08	18:29:00	24.1	452.9	38	4.12	27.8	29	45.8	0.3	4	0		-1	1	1	4	3	5	10	4	0	Manila	Philippines	0.0	0	51	3		1	1	1	0	0	0	0	0	0	0	0	
342	Deira	Autumn	19-Nov-08	18:36:00	24.1	452.9	38	4.12	27.7	28	45.8	0.8	4	0		1	1	1	1	2	1	17	1	0	Sinar State	Sudan	0.1	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
343	Deira	Autumn	19-Nov-08	18:51:00	24.1	452.9	38	4.12	27.6	24	44	1.7	4	-1		1	0	1	3	1	2	10	8	1	Laguna	Philippines	0.5	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
344	Deira	Autumn	19-Nov-08	19:01:00	23.1	452.9	38	4.12	27.6	24	44	1.7	5	0		0	0	1	2	3	6	10	0	0	Ontario	Canada	0.0	0	51	3	AC bus stops	1	2	1	0	0	0	0	0	0	0	0	
345	Deira	Autumn	19-Nov-08	19:08:00	23.1	452.9	38	4.12	27.6	30	44	1.2	3	-1		0	0	1	5	3	2	10	8	1	Kerala	India	0.2	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
346	Deira	Autumn	19-Nov-08	19:08:00	23.1	452.9	38	4.12	27.6	30	44	1.2	3	-1		0	0	1	5	3	2	10	8	1	Kerala	India	1.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
347	Deira	Autumn	19-Nov-08	19:16:00	23.1	452.9	38	4.12	27.6	30	44	1.2	6	0		0	0	1	3	1	2	10	8	1	Kerala	India	25.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	

Survey Database: Autumn – November 20, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sun glasses	Other notes
348	Satwa	Autumn	20-Nov-08	7:49:00	29.1	470.7	17	5.14	22.8	22	48.4	0	4	-1	0	0	0	1	2	3	1	10	6	0	Nueva Ecija	Philippines	0.5	0	20	3	make AC bus	2	1	1	0	0	0	0	0	0	0	0	
349	Satwa	Autumn	20-Nov-08	7:56:00	29.1	470.7	17	5.14	22.8	22	48.4	0	5	0	0	0	0	1	4	1	2	10	6	0	Batangas	Philippines	0.3	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
350	Satwa	Autumn	20-Nov-08	8:00:00	30.2	470.7	15	4.63	23	22	48.4	0	5	0	0	0	0	1	4	2	4	10	6	1	Islamabad	Pakistan	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
351	Satwa	Autumn	20-Nov-08	8:07:00	30.2	470.7	15	4.63	23.2	22	48.4	0.2	3	1	0	1	0	1	1	1	1	10	6	1	Nairobi	Kenya	0.7	0	20	3		1	2	1	0	0	0	0	0	0	1	0	shawl on n
352	Satwa	Autumn	20-Nov-08	8:12:00	30.2	470.7	15	4.63	23.2	22	48.4	0.2	4	0	0	-1	1	1	4	3	1	10	6	1	Nueva Ecija	Philippines	4.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
353	Satwa	Autumn	20-Nov-08	8:17:00	30.2	470.7	15	4.63	23.2	22	48.4	0.2	5	0	0	0	0	1	1	2	1	10	6	0	Bacolod	Philippines	5.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
354	Satwa	Autumn	20-Nov-08	8:22:00	30.2	470.7	15	4.63	23.5	18	48.4	0.2	4	1	0	-1	0	1	3	1	1	10	7	1	Bombay	India	2.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
355	Satwa	Autumn	20-Nov-08	8:30:00	30.2	470.7	15	4.63	24.1	18	43	0.4	3	0	0	0	1	1	1	3	1	10	5	1	Laguna	Philippines	15.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
356	Satwa	Autumn	20-Nov-08	8:30:00	30.2	470.7	15	4.63	24.1	18	43	0.4	2	0	0	0	1	1	1	3	1	10	5	1	Pampanga	Philippines	3.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
357	Satwa	Autumn	20-Nov-08	8:30:00	30.2	470.7	15	4.63	24.1	18	43	0.4	2	0	0	0	1	1	1	3	1	10	5	1	Pampanga	Philippines	6.0	0	10	2		2	1	3	0	0	0	0	0	0	0	0	
358	Satwa	Autumn	20-Nov-08	8:37:00	30.2	470.7	15	4.63	24.3	18	42	0.4	4	0	0	1	0	1	3	2	1	10	0	0	Lahore	Pakistan	1.0	0	20	2		2	2	1	0	0	0	0	0	0	1	0	
359	Satwa	Autumn	20-Nov-08	8:41:00	30.2	470.7	15	4.63	24.5	18	42.5	0.8	3	0	0	0	-1	1	3	3	1	10	6	0	Karachi	Pakistan	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	listening to
360	Satwa	Autumn	20-Nov-08	8:49:00	30.2	470.7	15	4.63	24.7	22	45	0.9	3	0	0	0	0	0	2	1	1	10	6	1	Kerala	India	0.3	0	20	2	more buses	2	2	2	0	0	0	0	0	0	1	0	shawl on s
361	Satwa	Autumn	20-Nov-08	8:49:00	30.2	470.7	15	4.63	24.7	22	45	0.9	4	0	0	0	0	1	2	1	1	10	6	1	Kerala	India	3.0	0	20	1		2	1	2	0	0	0	0	0	0	0	0	
362	Satwa	Autumn	20-Nov-08	8:58:00	30.2	470.7	15	4.63	26	20	42	1.8	4	0	0	0	0	1	3	2	1	10	6	1	General San	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
363	Satwa	Autumn	20-Nov-08	9:06:00	30.9	470.7	14	2.57	26	15	43	1.3	4	0	0	-1	0	1	1	3	1	10	6	1	Kerala	India	4.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
364	Satwa	Autumn	20-Nov-08	9:13:00	30.9	470.7	14	2.57	24.4	16	50	0.9	5	-1	0	0	0	1	1	1	1	10	6	1	Colombo	Sri Lanka	1.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
365	Satwa	Autumn	20-Nov-08	9:23:00	30.9	470.7	14	2.57	24.4	16	50	0.9	3	0	0	-1	0	1	4	1	1	10	6	1	Punjab	India	6.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
366	Satwa	Autumn	20-Nov-08	9:23:00	30.9	470.7	14	2.57	24.4	16	50	0.9	3	0	0	-1	0	1	4	1	1	10	6	1	Punjab	India	16.0	0	20	3		1	2	2	0	0	0	0	0	0	1	0	
367	Satwa	Autumn	20-Nov-08	9:30:00	30.9	470.7	14	2.57	25.5	19	50	0.9	2	0	0	0	0	1	3	2	1	10	0	0	Kerala	India	5.0	0	10	3		2	1	1	0	0	0	0	0	0	0	0	
368	Satwa	Autumn	20-Nov-08	13:01:00	27.9	470.7	41	4.63	22.5	16	47.3	0.3	4	0	0	-1	0	1	3	2	1	10	6	1	General San	Philippines	2.5	0	20	2		2	2	1	0	0	0	0	0	0	0	0	
369	Satwa	Autumn	20-Nov-08	13:07:00	27.9	470.7	41	4.63	24.2	31	46.3	3.5	4	0	0	1	1	1	3	2,3	1	10	7	1	West Benga	India	6.0	0	20	3		2	1	2	1	0	0	0	0	0	0	0	
370	Satwa	Autumn	20-Nov-08	13:07:00	27.9	470.7	41	4.63	24.2	31	46.3	3.5	4	0	0	1	1	1	3	2,3	1	10	7	1	West Benga	India	6.0	0	20	3		2	2	2	1	0	0	0	0	0	0	0	
371	Satwa	Autumn	20-Nov-08	13:14:00	27.9	470.7	41	4.63	23.1	18	48	2	4	-1	0	0	0	1	3	2	1	10	6	0		Philippines	3.2	0	20	3		2	2	3	0	0	0	0	0	0	0	0	
372	Satwa	Autumn	20-Nov-08	13:20:00	27.9	470.7	41	4.63	23.1	17	48.1	1.6	4	0	0	1	1	1	4	2	1	10	0	0	Negros	Philippines	6.0	0	20	3		2	1	2	0	0	0	0	0	0	0	1	
373	Satwa	Autumn	20-Nov-08	13:20:00	27.9	470.7	41	4.63	22.4	17	50.2	0.6	4	0	0	-1	0	1	3	2	2	10	6	1	Makati	Philippines	2.0	0	20	3	more waiting	2	2	1	0	0	0	0	0	0	0	0	
374	Satwa	Autumn	20-Nov-08	13:29:00	27.9	470.7	41	4.63	22.2	18	52.2	1.6	4	-1	0	1	0	1	1	lying (	1	10	6	0		Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
375	Satwa	Autumn	20-Nov-08	13:41:00	27.9	470.7	41	4.63	23.2	36	49.5	0.5	4	-1	-1	1	0	1	3	2	3	10	0	0		Sri Lanka	2.0	0	20	3	more transpor	2	1	2	1	0	0	0	1	0	0	0	
376	Satwa	Autumn	20-Nov-08	13:41:00	27.9	470.7	41	4.63	23.2	36	49.5	0.5	4	-1	-1	1	0	1	3	2	3	10	0	0		Sri Lanka	2.0	0	20	3		2	1	2	1	0	0	0	0	0	0	0	
377	Satwa	Autumn	20-Nov-08	13:49:00	27.9	470.7	41	4.63	27.3	30	74.3	1.8	4	0	0	0	0	1	1	3	1	10	6	1	Kathmandu	Nepal	7.0	0	20	3		1	1	3	1	0	0	0	0	0	0	0	
378	Satwa	Autumn	20-Nov-08	13:49:00	27.9	470.7	41	4.63	27.3	30	74.3	1.8	4	0	0	0	0	1	1	3	1	10	6	1		India	5.0	0	20	3		1	1	3	1	0	0	0	0	0	0	0	
379	Satwa	Autumn	20-Nov-08	13:49:00	27.9	470.7	41	4.63	27.3	30	74.3	1.8	4	0	0	0	0	1	1	3	1	10	6	1		Bangladesh	3.0	0	20	3		1	1	3	1	0	0	0	0	0	0	0	
380	Satwa	Autumn	20-Nov-08	13:55:00	27.9	470.7	41	4.63	26.2	35	45.8	0.6	4	0	0	0	0	1	2	2	2	10	7	1	South India	India	3.0	0	20	3		2	1	2	1	0	0	0	1	0	0	1	
381	Satwa	Autumn	20-Nov-08	13:55:00	27.9	470.7	41	4.63	26.2	35	45.8	0.6	4	0	0	1	1	1	3	1	1	10	7	1	Colombo	Sri Lanka	6.0	0	20	2		2	2	2	1	0	0	0	1	0	0	0	
382	Satwa	Autumn	20-Nov-08	14:02:00	27.0	470.7	42	3.09	24.5	32	47.2	1.3	4	0	0	1	1	1	3	1	1	10	7	1	Colombo	Sri Lanka	1.0	0	20	2		2	2	2	1	0	0	0	0	0	0	0	
383	Satwa	Autumn	20-Nov-08	14:06:00	27.0	470.7	42	3.09	24.2	18	48.1	1.3	4	1	0	0	0	0	3	3	1	10	0	0		Egypt	3.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
384	Satwa	Autumn	20-Nov-08	14:10:00	27.0	470.7	42	3.09	23.5	18	48.6	1.3	5	0	0	1	1	1	2	1	1	10	5	1	Caloocan	Philippines	0.5	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
385	Satwa	Autumn	20-Nov-08	14:10:00	27.0	470.7	42	3.09	23.5	18	48.6	1.3	6	0	0	1	1	1	2	1	1	10	5	1	Caloocan	Philippines	3.0	0	20	3		2	1	2	0	0	0	0	1	0	0	0	
386	Satwa	Autumn	20-Nov-08	14:22:00	27.0	470.7	42	3.09	23.1	20	50.4	1.5	5	1	0	0	0	1	1	2	1	10	4	1	Marikina	Philippines	6.0	0	20	3	proper pedest	2	1	1	0	0	0	0	0	0	0	0	
387	Satwa	Autumn	20-Nov-08	14:27:00	27.0	470.7	42	3.09	22.3	19	50	0.8	4	0	0	0	1	1	3	1	9	10	0	0	Rio de Janie	Brazil	2.5	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
388	Satwa	Autumn	20-Nov-08	16:46:00	25.6	470.7	50	3.09	28	33	52	0.6	6	0	0	0	0	1	3	3	1	15	0	0	Lahore	Pakistan	0.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
389	Satwa	Autumn	20-Nov-08	16:52:00	25.6	470.7	50	3.09	28	33	52	0.6	4	0	0	0	0	1	6	3	5	10	0	0	Batangas	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
390	Satwa	Autumn	20-Nov-08	16:59:00	25.6	470.7	50	3.09	27.7	28	51.6	0.5	5	0	-1	0	0	1	3	2	7	10	4	1	Punjab	India	2.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
391	Satwa	Autumn	20-Nov-08	16:59:00	25.6	470.7	50	3.09	27.7	28	51.6	0.5	5	0	-1	0	0	1	3	2	7	10	4	1	Calcutta	India	0.4	0	20	2		2	1	3	0	0	0	0	0	0	0	0	
392	Satwa	Autumn	20-Nov-08	16:59:00	25.6	470.7	50	3.09	27.7	28	51.6	0.5	3	1	-1	0	0	1	3	2	7	10	4	1	Bombay	India	5.0	0	20	1		2	1	3	0	0	0	0	0	0	0	0	
393	Satwa	Autumn	20-Nov-08	17:04:00	24.9	470.7	55	3.09	27.5	31	52	1.7	4	0	0	1	1	1	2	2	1	10	7	1	West Benga	India	1.5	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
394	Satwa	Autumn	20-Nov-08	17:07:00	24.9	470.7	55	3.09	27.2	31	52.1	2.1	6	0	0	0	0	1	3	3	1	10	5	1	Lahore	Pakistan	24.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
395	Satwa	Autumn	20-Nov-08	17:15:00	24.9	470.7	55	3.09	27.5	31	51.3	2.1	6	0	0	-1	0	1	5	2	2	10	0	0	Punjab	India	12.0	0	20	2		2	1	2	0	0	0	0	0	1	0	0	
396	Satwa	Autumn	20-Nov-08	17:22:00	24.9	470.7	55	3.09	27.1	31	52.3	2.2	5	0	0	-1	1	0	3	2	1	10	2	1	Kerala	India	12.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
397	Satwa	Autumn	20-Nov-08	17:29:00	24.9	470.7	55	3.09	26.7	28	52.3	1.5	4	0		0	0	1	2	1	3	10	5	0	Jakarta	Indonesia	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
398	Satwa	Autumn	20-Nov-08	17:29:00	24.9	470.7	55	3.09	26.7	28	52.3	1.5	4	0		0	0	1	3	1	3	10	5	0	Nairobi	Kenya	3.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
399	Satwa	Autumn	20-Nov-08	17:35:00	24.9	470.7	55	3.09	26.7	28	52.3	1.5	5	0		0	0	1	2	1	3	19	5	1	Beirut	Lebanon	30.0	0	20	3	more greens	1	1	1	0	0	0	0	0	0	0	0	smoking
400	Satwa	Autumn	20-Nov-08	17:49:00	24.9	470.7	55	3.09	26.5	28	50.7	2	3	0		1	0	1	3	2	1	10	7	1	Pampanga	Philippines	3.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
401	Satwa	Autumn	20-Nov-08	17:49:00	24.9	470.7	55	3.09	26.5	28	50.7	2	3	0		1	0	1	3	2	1	10	7	1	Pasig	Philippines	0.6	0.0	20	3		1	1	3	0	0	0	0	0	0	0	0	
402	Satwa	Autumn	20-Nov-08	17:49:00	24.9	470.7	55	3.09	26.5	28	50.7	2	3	0		1	0	1	3	1	1	10	7	1	Batangas	Philippines	2.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
403	Satwa	Autumn	20-Nov-08	17:49:00	24.9	470.7	55	3.09	26.5	28	50.7	2	3	0		1	0	1	3	1	1	10	7	1	Batangas	Philippines	0.6	0.0	20	3		1	1	3	0	0	0	0	0	0	0	0	
404	Satwa	Autumn	20-Nov-08	18:02:00	24.1	470.7	58	3.09	26.5	27	50	0.6	4	0		0	0	1	3	2	3	10	5	1	Victoria	South Africa	4.0	0	20	2	chairs	2	1	2	0	0	0	0	1	0	0	0	
405	Satwa	Autumn	20-Nov-08	18:05:00	24.1	470.7	58	3.09	26.5	27	50	0.6	3	0		0	0	1	3	2	3	10	5	0		France	0.2	0.0	20	2		2	1	2	0	0	0	0	0	0	0	0	
406	Satwa	Autumn	20-Nov-08	18:12:00	24.1	470.7	58	3.09	26.6	27	48.7	0.8	6	0		0	0	1	3	1	1	15	7	1	Lahore	Pakistan	30.0	0	20	3	plants	2	1	1	0	0	0	0	0	0	0	0	
407	Satwa	Autumn	20-Nov-08	18:16:00	24.1	470.7	58	3.09	26.4	26	48.8	1.7	5	0		0	0	1	3	4	1	13	7	1	Delhi	India	14.0	0.0	20	3		2	1	3	0	0	1	0	0	0	0	0	

Survey Database: Autumn – November 21, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
408	Deira	Autumn	21-Nov-08	8:01:00	28.9	444.5	34	1.03	21.4	20	57.5	0.4	4	0	0	0	0	1	3	3	1	10	7	0	Manila	Philippines	0.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
409	Deira	Autumn	21-Nov-08	8:01:00	28.9	444.5	34	1.03	21.4	20	57.5	0.4	4	0	0	0	0	1	3	3	1	10	7	0	Manila	Philippines	1.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
410	Deira	Autumn	21-Nov-08	8:07:00	28.9	444.5	34	1.03	20.5	21	58.1	0.4	5	0	0	0	0	1	1	2	1	10	7	1	Kerala	India	3.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
411	Deira	Autumn	21-Nov-08	8:07:00	28.9	444.5	34	1.03	20.5	21	58.1	0.4	4	0	0	0	0	1	1	2	1	10	7	1	Kerala	India	0.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
412	Deira	Autumn	21-Nov-08	8:14:00	28.9	444.5	34	1.03	20.5	19	57.6	1.1	6	0	0	0	0	1	1	1	1	10	2	1	Goa	India	20.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
413	Deira	Autumn	21-Nov-08	8:18:00	28.9	444.5	34	1.03	20.2	21	59.4	1.5	5	-1	0	0	1	1	1	1	1	10	2	1	Valenzuela	Philippines	0.4	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
414	Deira	Autumn	21-Nov-08	8:30:00	28.9	444.5	34	1.03	20.8	18	58.1	1	5	0	0	0	0	1	1	1	1	10	1	1	Kerala	India	2.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
415	Deira	Autumn	21-Nov-08	8:38:00	28.9	444.5	34	1.03	20.6	16	57.1	2	5	0	0	0	0	1	1	3	1	10	0	1	Hyderabad	India	2.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
416	Deira	Autumn	21-Nov-08	8:38:00	28.9	444.5	34	1.03	20.6	16	57.1	2	3	0	0	0	0	1	1	3	1	10	0	0	Hyderabad	India	2.0	0	20	2		2	1	2	0	0	0	0	0	0	0	0	
417	Deira	Autumn	21-Nov-08	8:46:00	28.9	444.5	34	1.03	21.1	19	54.7	0.8	7	0	0	0	0	1	2	1	1	16	7	1	Rizal	Philippines	2.0	0	20	3	AC everything	3	1	1	0	0	0	0	0	0	0	0	
418	Deira	Autumn	21-Nov-08	9:00:00	29.0	444.5	33	3.6	22.3	19	51.4	0.5	5	-1	0	0	0	1	3	2	1	20	8	1	Isabela	Philippines	14.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
419	Deira	Autumn	21-Nov-08	9:07:00	29.0	444.5	33	3.6	29.5	28	43	0.4	4	0	0	0	0	0	3	2	1	10	6	1	Cairo	Egypt	6.0	0	20	3	make transpo	1	1	1	1	0	0	0	0	0	0	1	
420	Deira	Autumn	21-Nov-08	9:14:00	29.0	444.5	33	3.6	30.5	35	42.5	2.1	6	0	0	0	0	1	3	3	1	10	4	1	Goa	India	24.0	0	20	3	lower house r	2	1	1	1	0	0	0	0	0	0	1	
421	Deira	Autumn	21-Nov-08	9:18:00	29.0	444.5	33	3.6	25.5	24	47.8	0.4	4	0	0	0	0	1	2	2	1	10	0	0		Pakistan	0.8	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
422	Deira	Autumn	21-Nov-08	9:24:00	29.0	444.5	33	3.6	33.8	33	38.5	0.5	3	0	0	-1	0	1	3	1	1	15	0	0	Patransha	India	0.3	0	20	3		1	1	1	1	0	0	0	0	0	0	0	
423	Deira	Autumn	21-Nov-08	9:30:00	29.0	444.5	33	3.6	28.1	29	44.4	0.3	4	0	0	0	0	1	2	1	1	13	7	1	Kerala	India	2.5	0	20	3		3	1	2	1	0	0	0	0	0	0	0	
424	Deira	Autumn	21-Nov-08	9:30:00	29.0	444.5	33	3.6	28.1	29	44.4	0.3	4	0	0	0	0	1	2	1	1	13	7	1	Kerala	India	1.0	0	20	3		3	1	2	1	0	0	0	0	0	0	0	
425	Deira	Autumn	21-Nov-08	9:38:00	29.0	444.5	33	3.6	24.8	24	46.2	0.3	4	0	0	0	0	1	2	1	1	10	0	0	Bulacan	Philippines	4.5	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
426	Deira	Autumn	21-Nov-08	9:38:00	29.0	444.5	33	3.6	24.8	24	46.2	0.3	4	0	0	0	0	1	3	1	1	10	0	0	Cavite	Philippines	1.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
427	Deira	Autumn	21-Nov-08	9:38:00	29.0	444.5	33	3.6	24.8	24	46.2	0.3	5	0	0	0	0	1	1	3	1	10	0	0	Cavite	Philippines	3.0	0	20	3		2	1	3	0	0	0	0	0	0	0	1	
428	Deira	Autumn	21-Nov-08	12:30:00	28.1	444.5	46	5.14	23.8	21	47.2	0.8	5	0	0	0	0	1	3	1	1	17	7	0	Rajistan	India	20.0	0				1	1	2	0	0	0	0	0	0	0	0	
429	Deira	Autumn	21-Nov-08	12:30:00	28.1	444.5	46	5.14	23.8	21	47.2	0.8	5	0	0	0	0	1	5	1	1	17	7	0	Rajistan	India	20.0	0				1	1	2	0	0	0	0	0	0	0	0	
430	Deira	Autumn	21-Nov-08	12:46:00	28.1	444.5	46	5.14	32.4	29	40.3	0.6	6	0	0	0	0	1	3	2	1	10	7	1	Ilocos	Philippines	10.0	0	20	2	AC bus stops	2	1	1	0	0	0	0	0	0	0	1	refers to la
431	Deira	Autumn	21-Nov-08	12:55:00	28.1	444.5	46	5.14	31.4	37	40.5	0.7	4	0	0	0	0	1	1	1	7	10	1	1		Zimbabwe	0.5	0	20	2	AC bus shelte	1	2	1	0	0	0	0	0	0	0	0	notes that i
432	Deira	Autumn	21-Nov-08	13:04:00	27.0	444.5	55	5.14	31.2	36	41.3	0.7	5	1	0	-1	0	1	3	2	2	10	3	0	Jakarta	Indonesia	1.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
433	Deira	Autumn	21-Nov-08	13:10:00	27.0	444.5	55	5.14	31.5	34	41.3	0.6	4	0	0	0	0	0	3	2	1	10	7	1	Nueva Ecija	Philippines	2.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
434	Deira	Autumn	21-Nov-08	13:10:00	27.0	444.5	55	5.14	31.5	34	41.3	0.6	4	0	0	0	0	0	3	2	1	10	7	1	Nueva Ecija	Philippines	2.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
435	Deira	Autumn	21-Nov-08	13:20:00	27.0	444.5	55	5.14	30.7	33	43.1	0.7	4	0	1	0	1	0	3	1	1	10	6	1	Tunis	Tunisia	1.5	0	20	3	canteen to wa	1	2	1	0	0	0	0	0	0	0	1	
436	Deira	Autumn	21-Nov-08	13:30:00	27.0	444.5	55	5.14	34.2	48	38	0.5	4	0	0	0	0	1	3	1	7	10	5	1		India	1.0	0	20	3		1	1	2	1	0	0	0	0	0	0	0	
437	Deira	Autumn	21-Nov-08	13:30:00	27.0	444.5	55	5.14	34.2	48	38	0.5	5	0	0	0	0	1	3	1	7	10	5	1		India	1.5	0	20	3		1	1	2	1	0	0	0	0	0	0	0	smoking
438	Deira	Autumn	21-Nov-08	13:38:00	27.0	444.5	55	5.14	32.7	42	38.3	1.6	5	0	0	0	0	1	1	1	1	10	8	1	Kumila	Bangladesh	8.0	0	20	1		2	1	2	0	0	0	0	0	0	0	0	
439	Deira	Autumn	21-Nov-08	13:39:00	27.0	444.5	55	5.14	32.7	42	38.3	1.6	3	0	0	0	0	1	1	1	1	10	7	1	Kerala	India	2.0	0	20	1		2	1	2	0	0	0	0	1	0	0	0	
440	Deira	Autumn	21-Nov-08	13:45:00	27.0	444.5	55	5.14	32.7	42	38.3	1.6	4	0	0	0	0	1	1	3	9	15	6	1	Kerala	India	0.6	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
441	Deira	Autumn	21-Nov-08	13:49:00	27.0	444.5	55	5.14	30.4	31	40.3	1.6	4	0	0	0	1	1	2	1	1	14	6	1	Peshawar	Pakistan	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
442	Deira	Autumn	21-Nov-08	13:55:00	27.0	444.5	55	5.14	29.8	34	43.4	1.7	5	0	0	0	0	1	2	3	6	10	0	0		France	0.0	0	51	3		2	2	2	0	0	0	0	0	0	0	0	
443	Deira	Autumn	21-Nov-08	13:55:00	27.0	444.5	55	5.14	29.8	34	43.4	1.7	5	0	0	0	0	1	2	3	6	10	6	0		France	6 days	0	51	3		2	1	2	1	0	0	0	0	0	0	0	
444	Deira	Autumn	21-Nov-08	14:00:00	26.4	444.5	56	4.63	30.5	34	46.7	1.5	5	0	0	0	0	1	5	1	6	10	2	1	Mumbai	India	0.4	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
445	Deira	Autumn	21-Nov-08	14:10:00	26.4	444.5	56	4.63	30.7	39	48.5	0.8	3	0	0	0	0	1	2	1	3	10	2	1	Adis Ababa	Ethiopia	1.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
446	Deira	Autumn	21-Nov-08	14:10:00	26.4	444.5	56	4.63	30.7	39	48.5	0.8	4	0	0	0	0	1	2	1	3	10	2	1	Adis Ababa	Ethiopia	1.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
447	Deira	Autumn	21-Nov-08	14:10:00	26.4	444.5	56	4.63	30.7	39	48.5	0.8	3	0	0	0	0	1	2	1	3	10	0	0	Adis Ababa	Ethiopia	1.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
448	Deira	Autumn	21-Nov-08	14:10:00	26.4	444.5	56	4.63	30.7	39	48.5	0.8	4	0	0	0	0	1	2	1	3	10	0	0	Adis Ababa	Ethiopia	0.0	0	51	3		2	1	3	0	0	0	0	0	0	0	0	
449	Deira	Autumn	21-Nov-08	14:28:00	26.4	444.5	56	4.63	30.7	31	42.1	0.6	3	0	0	0	0	0	3	1	1	10	7	1	Bombay	India	1.3	0	51	3	better shelters	2	1	1	0	0	0	0	0	0	0	0	
450	Deira	Autumn	21-Nov-08	14:35:00	26.4	444.5	56	4.63	27.7	31	54	0.6	4	0	0	0	0	1	5	3	3	10	7	1	Isabela	Philippines	5.0	0	20	3		1	2	3	0	0	0	0	0	0	0	0	
451	Deira	Autumn	21-Nov-08	14:35:00	26.4	444.5	56	4.63	27.7	31	54	0.6	4	0	0	0	0	1	3	3	1	10	1	1	Cagayan de	Philippines	5.0	0	20	3		1	2	3	0	0	0	0	0	0	0	1	
452	Deira	Autumn	21-Nov-08	14:35:00	26.4	444.5	56	4.63	27.7	31	54	0.6	3	0	0	0	0	1	3	3	1	10	2	1	Pampanga	Philippines	5.0	0	20	3		1	2	3	0	0	0	0	0	0	0	0	
453	Deira	Autumn	21-Nov-08	17:11:00	25.8	444.5	52	1.54	28.2	32	53.6	0.8	4	0	0	0	0	1	3	3	11	10	0	1	Dhaka	Bangladesh	10.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
454	Deira	Autumn	21-Nov-08	17:18:00	25.8	444.5	52	1.54	28.2	32	53.6	0.8	3	0	0	0	0	1	2	3	9	10	0	0	Kerala	India	1.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
455	Deira	Autumn	21-Nov-08	17:18:00	25.8	444.5	52	1.54	28.2	32	53.6	0.8	4	0	0	0	0	1	2	1	1	10	2	1	Gujarat	India	0.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
456	Deira	Autumn	21-Nov-08	17:25:00	25.8	444.5	52	1.54	27.5	31	58	0.3	4	0	0	0	0	1	2	1	1	10	4	1	Dhaka	Bangladesh	0.3	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
457	Deira	Autumn	21-Nov-08	17:25:00	25.8	444.5	52	1.54	27.5	31	58	0.3	4	0	0	0	0	1	2	1	1	10	4	1	Dhaka	Bangladesh	0.3	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
458	Deira	Autumn	21-Nov-08	17:33:00	25.8	444.5	52	1.54	27.5	31	58	0.3	4	0	0	0	0	1	5	3	5	10	7	1		Philippines	0.3	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
459	Deira	Autumn	21-Nov-08	17:38:00	25.8	444.5	52	1.54	27.9	33	55.3	0.3	4	0	0	0	1	1	2	3	1	20	0	0	Kerala	India	0.1	0	20	3		2	1	2	0	0	0	0	0	0	1	0	
460	Deira	Autumn	21-Nov-08	17:38:00	25.8	444.5	52	1.54	27.9	33	55.3	0.3	4	0	0	0	0	1	2	3	1	20	0	0	Kerala	India	0.5	0	20	3		2	2	2	0	1	0	0	0	0	0	0	
461	Deira	Autumn	21-Nov-08	17:45:00	25.8	444.5	52	1.54	27.9	33	55.3	0.3	4	0	0	0	0	1	1	1	1	10	1	1	Kerala	India	10.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
462	Deira	Autumn	21-Nov-08	17:50:00	25.8	444.5	52	1.54	27.4	31	53.8	0	4	-1	0	-1	0	1	3	2	1	15	1	0	Manila	Philippines	3.0	0	20	3	no summer	2	1	1	0	0	0	0	0	0	0	0	
463	Deira	Autumn	21-Nov-08	18:02:00	24.2	444.5	58	1.54	26.5	30	53.7	0.3	5	0	0	0	0	1	1	3	1	17	6	1	Kerala	India	36.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
464	Deira	Autumn	21-Nov-08	18:11:00	24.2	444.5	58	1.54	26.8	31	53.3	0.4	4	0	0	0	1	1	3	1	9	10	0	0	Barisal	Bangladesh	1.0	0	20	2	make place le	2	1	3	0	0	0	0	0	0	0	0	
465	Deira	Autumn	21-Nov-08	18:11:00	24.2	444.5	58	1.54	26.8	31	53.3	0.4	4	0	0	0	1	1	3	1	9	10	0	0	Dhaka	Bangladesh	1.0	0	20	2		2	1	3	0	0	0	0	0	0	0	0	
466	Deira	Autumn	21-Nov-08	18:21:00	24.2	444.5	58	1.54	26.8	31	53.3	0.4	4	0	0	0	1	1	3	1	9	10	0	0	Dhaka	Bangladesh	1.0	0	20	2		2	1	3	0	0	0	0	0	0	0	0	
467	Deira	Autumn	21-Nov-08	18:29:00	24.2	444.5	58	1.54	25.8	27	53.5	0.4	4	0	0	0	0	1	2	1	2	10	6	0	Bangalore	India	0.7	0	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	0	
468	Deira	Autumn	21-Nov-08	18:29:00	24.2	444.5	58	1.54	26.1	30	53.5	0.8	4	0	0	0	0	1	3	2	1	10	0	0	Bulacan	Philippines	1.0	0	20	3	AC bus stops	2	1	1	0	0	0	0	0	0	0	0	
469	Deira	Autumn	21-Nov-08	18:37:00	24.2	444.5	58	1.54	25.6	25	54.2	0.9	3	0	0	0	1	1	3	1	1	10	2	1	Hyderabad	India	2.5	0	20	3	better facilities	2	1	1	0	0	0	0	0	0	0	0	

Survey Database: Winter – January 20, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
470	Deira	Winter	20-Jan-09	7:18:00	19.5	446.9	45	2.06	13.5	13	59.2	1	4	-2	0	-1	1	1	2	1	1	10	5	1	Manila	Philippines	6.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
471	Deira	Winter	20-Jan-09	7:20:00	19.5	446.9	45	2.06	12.9	10	59.7	1.3	4	-1	0	-1	1	1	3	3	1	10	5	1	Hyderabad	India	5.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
472	Deira	Winter	20-Jan-09	7:26:00	19.5	446.9	45	2.06	13.1	11	60.2	0.9	7	-1	-1	0	0	1	3	3	1	10	6	1	Beirut	Lebanon	34.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
473	Deira	Winter	20-Jan-09	7:33:00	19.5	446.9	45	2.06	13.3	11	59.2	0.3	7	-1	0	0	0	1	3	1	1	10	8	0	Karachi	Pakistan	8.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	with tie
474	Deira	Winter	20-Jan-09	7:40:00	19.5	446.9	45	2.06	13.3	11	57	1.4	4	-1	0	0	0	1	2	3	1	10	6	1	Manila	Philippines	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
475	Deira	Winter	20-Jan-09	7:50:00	19.5	446.9	45	2.06	13.7	12	55.3	0.9	5	-1	0	1	0	0	3	2	1	10	6	1	Bicol	Philippines	0.4	0	20	3		2	2	2	0	0	0	0	0	0	1	0	
476	Deira	Winter	20-Jan-09	7:50:00	19.5	446.9	45	2.06	13.7	12	55.3	0.9	5	-1	0	1	0	1	3	2	1	10	6	1	Mindanao	Philippines	3.0	0	20	3		2	2	2	0	0	0	0	0	0	1	0	
477	Deira	Winter	20-Jan-09	8:00:00	20.4	446.9	43	1.54	13.8	12	55.3	0.9	4	0	0	-1	0	1	5	2	1	10	6	0	Skikda	Algeria	1.2	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
478	Deira	Winter	20-Jan-09	8:07:00	20.4	446.9	43	1.54	14	10	54.3	1.2	4	-1	0	0	1	1	3	3	1	10	6	0	Manila	Philippines	1.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
479	Deira	Winter	20-Jan-09	8:07:00	20.4	446.9	43	1.54	14	10	54.3	1.2	4	-1	0	0	1	1	3	3	1	10	6	0	Quezon City	Philippines	1.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
480	Deira	Winter	20-Jan-09	8:12:00	20.4	446.9	43	1.54	14.8	12	53.4	0.2	3	-1	0	1	0	1	3	3	9	10	6	1	Rajstan	India	1.0	0	20	2		1	1	3	0	0	0	0	0	0	0	0	
481	Deira	Winter	20-Jan-09	8:12:00	20.4	446.9	43	1.54	14.8	12	53.4	0.2	4	0	1	1	0	1	3	3	9	10	6	1	Rajstan	India	1.0	0	20	2		1	1	3	0	0	0	0	0	0	0	0	
482	Deira	Winter	20-Jan-09	8:12:00	20.4	446.9	43	1.54	14.8	12	53.4	0.2	4	-1	0	1	0	1	3	3	9	10	6	1	Rajstan	India	1.0	0	20	2		1	1	3	0	0	0	0	0	0	0	0	
483	Deira	Winter	20-Jan-09	8:12:00	20.4	446.9	43	1.54	14.8	12	53.4	0.2	3	-1	0	1	0	1	3	3	9	10	6	1	Rajstan	India	1.0	0	20	2		1	1	3	0	0	0	0	0	0	0	0	
484	Deira	Winter	20-Jan-09	8:20:00	20.4	446.9	43	1.54	14.9	12	53.4	0.6	5	0	0	-1	1	1	4	2	1	10	6	0	Kerala	India	11.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
485	Deira	Winter	20-Jan-09	8:30:00	20.4	446.9	43	1.54	15.2	11	57.3	0.6	5	-1	0	0	-1	1	3	3	1	10	5	1	Nairobi	Kenya	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
486	Deira	Winter	20-Jan-09	8:35:00	20.4	446.9	43	1.54	15.5	12	56.6	0.6	5	-1	0	0	0	1	5	2	5	20 wo	5	1	Aden	Yemen	9.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
487	Deira	Winter	20-Jan-09	8:43:00	20.4	446.9	43	1.54	20	15	48.6	0.4	4	-1	0	1	0	1	3	2	1	10	6	1	Hyderabad	India	3.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
488	Deira	Winter	20-Jan-09	8:47:00	20.4	446.9	43	1.54	18	14	50.7	0.5	3	-2	-1	1	1	0	3	1	1	10	5	1	Mumbai	India	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
489	Deira	Winter	20-Jan-09	8:53:00	20.4	446.9	43	1.54	23.4	20	41.1	0.6	3	-2	0	0	1	1	2	3	2	10	8	1	Chitagram	Bangladesh	2.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
490	Deira	Winter	20-Jan-09	12:30:00	20.4	446.9	45	4.12	22.1	32	39	0.4	3	0	0	0	1	1	4	1	6	10	0	0	Karachi	Pakistan	0.0	0	51	3		1	1	1	0	0	0	0	0	0	0	0	
491	Deira	Winter	20-Jan-09	12:40:00	20.4	446.9	45	4.12	23.3	31	32.5	1.7	3	-1	0	0	0	1	3	1	1	10	3	0	Colombo	Sri Lanka	1.5	0	20	3		2	2	1	0	0	0	0	0	0	0	1	
492	Deira	Winter	20-Jan-09	12:47:00	20.4	446.9	45	4.12	22.8	24	36.2	0.9	0	0	0	0	1	1	3	2	1	10	2	1	Mumbai	India	2.0	0	20	3		2	1	1	0	0	0	0	0	0	1	0	
493	Deira	Winter	20-Jan-09	12:52:00	20.4	446.9	45	4.12	23.3	28	36	1.1	4	-1	0	0	0	1	1	3	1	10	6	1	Bataan	Philippines	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	1	
494	Deira	Winter	20-Jan-09	12:58:00	20.4	446.9	45	4.12	26.8	34	32.7	2.4	4	-2	0	1	0	0	2	1	2	10	8	1	Kerala	India	6.0	0	20	3		2	2	1	1	0	0	0	0	0	1	0	
495	Deira	Winter	20-Jan-09	13:05:00	19.8	446.9	47	5.14	23.4	29	35.5	2.9	4	-1	0	0	1	1	5	2	5	10	7	1	Kerala	India	12.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
496	Deira	Winter	20-Jan-09	13:05:00	19.8	446.9	47	5.14	23.4	29	35.5	2.9	7	-1	0	0	1	1	5	2	5	10	7	1	Kerala	India	12.0	0	20	3		1	1	3	0	0	0	0	1	0	0	0	
497	Deira	Winter	20-Jan-09	13:05:00	19.8	446.9	47	5.14	23.4	29	35.5	2.9	4	-1	0	0	1	1	5	2	5	10	7	1	Kerala	India	0.5	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
498	Deira	Winter	20-Jan-09	13:15:00	19.8	446.9	47	5.14	24.4	25	34.5	0.9	4	-1	0	-1	0	1	3	3	1	10	6	1	Quezon City	Philippines	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	1	
499	Deira	Winter	20-Jan-09	13:20:00	19.8	446.9	47	5.14	24.6	37	33.9	2.5	3	0	0	1	0	1	2	3	2	10	0	1	Karachi	Pakistan	2.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
500	Deira	Winter	20-Jan-09	13:27:00	19.8	446.9	47	5.14	22	27	34	1.6	5	0	0	0	1	1	4	3	2	10	3	1	Kerala	India	13.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
501	Deira	Winter	20-Jan-09	13:32:00	19.8	446.9	47	5.14	24.4	40	32.8	1.4	6	-1	0	-1	1	1	3	2	1	18	0	0		Zanzibar	20.0	0	20	2		2	1	1	1	0	0	0	1	0	0	0	
502	Deira	Winter	20-Jan-09	13:37:00	19.8	446.9	47	5.14	24.5	39	33.6	0.9	4	0	0	1	0	1	4	3	2	10	3	1	Hyderabad	India	4.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	with tie
503	Deira	Winter	20-Jan-09	13:43:00	19.8	446.9	47	5.14	24.2	36	32.2	1.8	4	0	0	0	0	1	3	3	1	10	6	1	Kathmandu	Nepal	3.0	0	20	3		2	2	1	0	0	0	0	0	0	1	0	
504	Deira	Winter	20-Jan-09	13:47:00	19.8	446.9	47	5.14	23.7	35	32.5	2.5	4	0	0	-1	0	1	1	1	1	10	0	0	Bulacan	Philippines	4.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
505	Deira	Winter	20-Jan-09	13:52:00	19.8	446.9	47	5.14	23.8	34	37.6	1.6	4	-2	0	0	0	1	3	3	2	20	1	0	Kalthoum	Sudan	1.0	0	20	3		1	1	1	1	0	0	0	0	0	0	0	
506	Deira	Winter	20-Jan-09	14:08:00	18.9	446.9	48	4.12	24.8	39	36.1	3.5	4	-1	0	-1	0	1	1	3	2	15	0	0		Syria	1.0	0	20	3		2	1	2	1	0	0	0	0	0	0	1	
507	Deira	Winter	20-Jan-09	14:08:00	18.9	446.9	48	4.12	24.8	39	36.1	3.5	4	-1	0	-1	0	1	1	3	2	15	0	0		Syria	1.0	0	20	3		2	1	2	1	0	0	0	0	0	0	0	
508	Deira	Winter	20-Jan-09	14:12:00	18.9	446.9	48	4.12	22.2	36	38.5	1.7	4	-1	0	0	0	1	3	2	2	10	0	0	Peshawar	Pakistan	27.0	0	20	3		1	1	1	1	0	0	0	0	0	0	0	
509	Deira	Winter	20-Jan-09	14:18:00	18.9	446.9	48	4.12	23.5	32	34.4	2.3	4	-2	-1	1	1	0	5	2	5	10	3	1	Pampanga	Philippines	0.4	0	20	3		1	1	3	1	0	0	0	0	0	0	0	
510	Deira	Winter	20-Jan-09	17:19:00	18.3	446.9	60	3.09	20.7	22	39.3	1.2	4	0	0	0	0	1	3	1	1	10	4	1	India	Mumbai	0.7	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
511	Deira	Winter	20-Jan-09	17:19:00	18.3	446.9	60	3.09	20.7	22	39.3	1.2	3	0	0	0	0	1	3	1	1	10	4	1	India	Mumbai	0.7	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
512	Deira	Winter	20-Jan-09	17:37:00	18.3	446.9	60	3.09	19.8	20	41.6	0.7	4	0	0	0	0	1	5	2	2	10	8	1	Pakistan	Islamabad	1.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	with tie
513	Deira	Winter	20-Jan-09	17:37:00	18.3	446.9	60	3.09	19.8	20	41.6	0.7	4	0	0	0	0	1	5	2	2	10	8	1	Pakistan	Jang	1.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	with tie
514	Deira	Winter	20-Jan-09	17:45:00	18.3	446.9	60	3.09	19.7	20	41.6	1.4	4	-1	0	0	0	1	1	1	1	10	0	0	Cavite	Philippines	0.2	0	20	3		2	1	2	0	0	0	0	0	0	1	0	
515	Deira	Winter	20-Jan-09	17:45:00	18.3	446.9	60	3.09	19.7	20	41.6	1.4	4	-1	0	0	0	1	1	1	1	10	0	0	Laguna	Philippines	1.0	0	20	3		2	1	2	0	0	0	0	0	0	1	0	
516	Deira	Winter	20-Jan-09	17:50:00	18.3	446.9	60	3.09	19.3	22	43.1	1	4	-1	0	0	1	1	5	1	5	10	7	1	Kandy	Sri Lanka	1.0	0	20	2		2	1	2	0	0	0	0	1	0	0	0	
517	Deira	Winter	20-Jan-09	17:50:00	18.3	446.9	60	3.09	19.3	22	43.1	1	4	-1	0	0	1	1	5	2	1	10	7	1	Kandy	Sri Lanka	1.0	0	20	2		2	1	2	0	0	0	0	1	0	0	0	
518	Deira	Winter	20-Jan-09	17:59:00	18.3	446.9	60	3.09	18.9	24	44	0.3	3	0	0	0	1	1	5	2	2	10	5	1	Kathmandu	Nepal	2.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
519	Deira	Winter	20-Jan-09	18:04:00	18.2	446.9	60	2.06	18.6	18	44.3	0.3	4	-1		1	0	1	1	3	2	10	5	0	Bombay	India	10.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
520	Deira	Winter	20-Jan-09	18:08:00	18.2	446.9	60	2.06	18.5	19	43.6	0.5	4	-1		0	0	1	1	1	2	10	5	1	Kerala	India	0.7	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie, sn
521	Deira	Winter	20-Jan-09	18:12:00	18.2	446.9	60	2.06	18.4	21	43.8	0.3	4	-1		-1	0	1	3	2	2	10	6	0	Tamilnadu	India	0.1	0	51	3		2	1	1	0	0	0	0	0	0	0	0	with tie
522	Deira	Winter	20-Jan-09	6:20:00	18.2	446.9	60	2.06	19.3	20	43.4	0.3	4	-1		1	0	1	3	1	1	10	5	1	Bombay	India	3.0	0	20	3		1	1	1	0	0	0	0	1	0	0	0	
523	Deira	Winter	20-Jan-09	18:25:00	18.2	446.9	60	2.06	18.5	18	43.1	0.4	3	-1		0	0	1	2	1	2	10	5	1		India	1.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
524	Deira	Winter	20-Jan-09	18:25:00	18.2	446.9	60	2.06	18.5	18	43.1	0.4	4	-1		0	0	1	2	1	2	10	5	1		India	1.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
525	Deira	Winter	20-Jan-09	18:25:00	18.2	446.9	60	2.06	18.5	18	43.1	0.4	3	-1		0	0	1	2	1	2	10	5	1		India	1.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
526	Deira	Winter	20-Jan-09	18:32:00	18.2	446.9	60	2.06	18.9	20	43.4	1.2	5	-1		0	1	1	5	3	3	10	8	1	Quezon City	Philippines	3.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
527	Deira	Winter	20-Jan-09	18:32:00	18.2	446.9	60	2.06	18.9	20	43.4	1.2	5	-1		0	1	1	5	3	3	10	8	1	Manila	Philippines	2.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
528	Deira	Winter	20-Jan-09	18:38:00	18.2	446.9	60	2.06	18.5	19	43.8	0.8	4	-1		1	0	1	3	2	5	10	8	1	Kerala	India	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
529	Deira	Winter	20-Jan-09	18:48:00	18.2	446.9	60	2.06	17.4	14	46	0.3	6	0		-1	0	1	1	3	1	16	7	0	Lahore	Pakistan	1.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	

Survey Database: Winter – January 21, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
530	Satwa	Winter	21-Jan-09	7:21:00	20.7	416.8	49	1.54	12.1	13	58	0.2	4	0	0	0	0	1	3	2	1	10	6	1	Lahore	Pakistan	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
531	Satwa	Winter	21-Jan-09	7:30:00	20.7	416.8	49	1.54	12.2	10	60.8	0.2	4	-1	0	0	0	1	3	1	1	10	6	1	Isabela	Philippines	2.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
532	Satwa	Winter	21-Jan-09	7:30:00	20.7	416.8	49	1.54	12.2	10	60.8	0.2	5	-1	0	0	0	1	3	1	1	10	6	1	Bulacan	Philippines	3.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
533	Satwa	Winter	21-Jan-09	7:34:00	20.7	416.8	49	1.54	12	10	62	0.3	4	-1	0	0	0	1	3	2	1	10	6	1	Lahore	Pakistan	6.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
534	Satwa	Winter	21-Jan-09	7:40:00	20.7	416.8	49	1.54	12.4	10	60.6	0.3	3	0	0	0	0	0	3	2	1	10	7	1	Nairobi	Kenya	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
535	Satwa	Winter	21-Jan-09	7:45:00	20.7	416.8	49	1.54	13.4	10	61.4	0.3	4	-2	0	1	-1	0	2	3	1	10	5	1	Las Pinas	Philippines	3.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
536	Satwa	Winter	21-Jan-09	7:52:00	20.7	416.8	49	1.54	12.8	11	61.1	0.2	4	-1	0	-1	0	1	3	1	1	10	8	1	Alabang	Philippines	1.5	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
537	Satwa	Winter	21-Jan-09	8:00:00	20.5	416.8	49	3.6	13.5	10	60.6	0.4	3	0	0	1	1	1	3	1	1	10	7	1	Pangasinan	Philippines	1.0	0	20	3		2	2	3	0	0	0	0	0	0	0	0	
538	Satwa	Winter	21-Jan-09	8:00:00	20.5	416.8	49	3.6	13.5	10	60.6	0.4	4	0	0	1	1	1	4	1	1	10	6	1		Philippines	1.0	0	20	3		2	2	3	0	0	0	0	0	0	0	0	
539	Satwa	Winter	21-Jan-09	8:00:00	20.5	416.8	49	3.6	13.5	10	60.6	0.4	5	0	0	1	1	1	4	1	1	10	6	1		Philippines	1.0	0	20	3		2	2	3	0	0	0	0	0	0	0	0	
540	Satwa	Winter	21-Jan-09	8:10:00	20.5	416.8	49	3.6	13.3	8	59.9	0.9	4	-1	0	0	1	1	3	2	1	10	7	0	Batangas	Philippines	0.1	0	51	2		2	1	1	0	0	0	0	0	0	0	0	
541	Satwa	Winter	21-Jan-09	8:16:00	20.5	416.8	49	3.6	13.4	10	60.5	1.2	4	-1	1	0	0	1	1	3	1	10	5	1	Kerala	India	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
542	Satwa	Winter	21-Jan-09	8:19:00	20.5	416.8	49	3.6	13.5	10	59.6	0.4	4	-2	0	0	0	1	3	2	1	10	7	0	Caloocan	Philippines	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
543	Satwa	Winter	21-Jan-09	8:27:00	20.5	416.8	49	3.6	13.8	11	58.9	0.4	5	-1	0	1	0	1	2	3	1	10	8	1	Mumbai	India	20.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
544	Satwa	Winter	21-Jan-09	8:35:00	20.5	416.8	49	3.6	14.4	10	57.7	0.5	4	0	1	0	0	1	2	1	1	10	6	1	Peshawar	Pakistan	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
545	Satwa	Winter	21-Jan-09	8:40:00	20.5	416.8	49	3.6	14.7	11	57.2	0.3	4	-1	0	1	0	1	3	2	1	10	6	1	Nueva Ecija	Philippines	1.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
546	Satwa	Winter	21-Jan-09	8:57:00	20.5	416.8	49	3.6	15	11	55.7	0.3	4	-1	0	0	1	0	2	1	1	10	7	1	Oriental Min	Philippines	3.5	0	20	2		2	1	1	0	0	0	0	1	0	0	0	
547	Satwa	Winter	21-Jan-09	9:05:00	20.6	416.8	49	4.12	15.2	15	55.1	0.8	5	-1	0	0	1	1	3	3	1	10	3	1	Nueva Ecija	Philippines	6.0	0	20	2		2	2	2	0	0	0	0	0	0	0	0	
548	Satwa	Winter	21-Jan-09	9:05:00	20.6	416.8	49	4.12	15.2	15	55.1	0.8	5	-1	0	0	1	1	3	3	1	10	3	1	Nueva Ecija	Philippines	6.0	0	20	2		2	1	2	0	0	0	0	0	0	0	0	
549	Satwa	Winter	21-Jan-09	9:10:00	20.6	416.8	49	4.12	15.2	11	55.7	0.7	3	0	0	0	0	1	2	2	1	10	5	1		Pakistan	1.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
550	Satwa	Winter	21-Jan-09	12:34:00	20.7	416.8	52	6.17	25.5	29	42.7	0.4	3	-1	0	0	0	1	3	1	1	10	0	0	Peshawar	Pakistan	1.5	0	20	3		2	1	1	1	0	0	0	0	0	0	1	
551	Satwa	Winter	21-Jan-09	12:42:00	20.7	416.8	52	6.17	23.3	30	49.3	0.3	4	-1	0	0	0	1	1	1	9	11	7	1	Manila	Philippines	4.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
552	Satwa	Winter	21-Jan-09	12:50:00	20.7	416.8	52	6.17	25.9	26	43.7	1.5	5	-1	0	-1	0	1	2	3	1	10	4	1	Bulacan	Philippines	4.0	0	20	3		2	1	2	1	0	0	0	1	0	0	1	
553	Satwa	Winter	21-Jan-09	12:50:00	20.7	416.8	52	6.17	25.9	26	43.7	1.5	4	-1	0	-1	0	1	2	3	1	10	7	1	Bulacan	Philippines	4.0	0	20	3		2	2	2	1	0	0	0	0	0	0	1	
554	Satwa	Winter	21-Jan-09	12:57:00	20.7	416.8	52	6.17	21.4	16	47.8	1.7	4	-1	0	0	0	1	1	3	2	10	6	1	Makati	Philippines	3.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
555	Satwa	Winter	21-Jan-09	13:00:00	20.2	416.8	52	4.63	18.8	15	50.6	1.1	4	0	0	-1	0	1	3	1	2	10	8	0	Chittagong	Bangladesh	10.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
556	Satwa	Winter	21-Jan-09	13:07:00	20.2	416.8	52	4.63	18.8	15	51.3	1.9	3	0	0	1	0	1	2	2	1	10	8	0	Pangasinan	Philippines	0.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
557	Satwa	Winter	21-Jan-09	13:17:00	20.2	416.8	52	4.63	19.5	17	51.7	0.9	3	0	0	0	0	1	2	1	11	12	6	0	Kathmandu	Nepal	0.0	0	10	3		1	1	3	0	0	0	0	0	0	0	0	with tie, sm
558	Satwa	Winter	21-Jan-09	13:17:00	20.2	416.8	52	4.63	19.5	17	51.7	0.9	3	0	0	0	0	1	2	1	11	12	6	0	Darjeeling	India	0.0	0	10	3		1	1	3	0	0	0	0	0	0	0	0	with tie, sm
559	Satwa	Winter	21-Jan-09	13:17:00	20.2	416.8	52	4.63	19.5	17	51.7	0.9	4	0	0	0	0	1	2	1	11	12	6	0	Kathmandu	Nepal	0.0	0	10	3		1	1	3	0	0	0	0	1	0	0	0	with tie, sm
560	Satwa	Winter	21-Jan-09	13:17:00	20.2	416.8	52	4.63	19.5	17	51.7	0.9	3	0	0	0	0	1	2	1	11	12	6	0	Kathmandu	Nepal	0.0	0	10	3		1	1	3	0	0	0	0	0	0	0	0	with tie, sm
561	Satwa	Winter	21-Jan-09	13:17:00	20.2	416.8	52	4.63	19.5	17	51.7	0.9	4	0	0	0	0	1	2	1	11	12	6	0	Kathmandu	Nepal	0.0	0	10	3		1	1	3	0	0	0	0	1	0	0	0	with tie, sm
562	Satwa	Winter	21-Jan-09	13:25:00	20.2	416.8	52	4.63	19	17	51.5	1.4	6	0	0	1	0	1	1	1	2	12	6	1	Batangas	Philippines	9.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
563	Satwa	Winter	21-Jan-09	13:40:00	20.2	416.8	52	4.63	20.7	17	50.7	1.5	6	-1	0	0	0	1	4	2	1	15	7	1	India	Kerala	1.0	0	20	2		2	1	1	0	0	0	0	1	0	0	0	
564	Satwa	Winter	21-Jan-09	13:45:00	20.2	416.8	52	4.63	24.9	32	41.6	2	4	-1	0	0	0	1	1	2	1	10	8	1	Kathmandu	Nepal	8.0	0	20	3		2	1	1	1	0	0	0	0	0	0	1	
565	Satwa	Winter	21-Jan-09	13:50:00	20.2	416.8	52	4.63	27.2	32	42.5	1.2	4	-1	0	0	1	1	2	2	1	10	2	0	Punjab	Pakistan	4.0	0	20	2		1	1	1	1	0	0	0	0	0	0	0	
566	Satwa	Winter	21-Jan-09	13:55:00	20.2	416.8	52	4.63	26.6	31	42.4	1.8	5	-2	0	1	1	0	1	1	1	10	7	1	Kandy	Sri Lanka	20.0	0	20	2		1	2	1	1	0	0	0	0	0	0	0	
567	Satwa	Winter	21-Jan-09	14:02:00	19.5	416.8	55	3.09	25.2	32	46.6	2	4	0	0	1	1	1	2	3	1	10	7	1	Laguna	Philippines	2.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
568	Satwa	Winter	21-Jan-09	14:05:00	19.5	416.8	55	3.09	25.9	34	46.2	1.8	5	-2	0	0	0	1	3	1	1	10	7	1	Karachi	Pakistan	7.0	0	20	3		2	2	1	1	0	0	0	0	0	1	0	
569	Satwa	Winter	21-Jan-09	14:12:00	19.5	416.8	55	3.09	26.7	36	45	1.7	4	-1	0	-1	1	1	1	1	1	10	8	1	Calcutta	India	4.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
570	Satwa	Winter	21-Jan-09	17:30:00	19.0	416.8	56	3.09	21.7	23	41.8	0.3	5	-1	0	-1	0	1	3	1	1	10	6	1	Kuala Lumpu	Malaysia	1.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
571	Satwa	Winter	21-Jan-09	17:30:00	19.0	416.8	56	3.09	21.7	23	41.8	0.3	5	0		-1	0	1	3	1	1	10	6	1	Kuala Lumpu	Malaysia	0.5	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
572	Satwa	Winter	21-Jan-09	17:46:00	19.0	416.8	56	3.09	18	19	47	0.2	3	-2		0	0	0	3	1	1	10	6	1	Manila	Philippines	2.0	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
573	Satwa	Winter	21-Jan-09	17:46:00	19.0	416.8	56	3.09	18	19	47	0.2	3	-2		1	0	0	3	1	1	10	6	1	Manila	Philippines	2.5	0	20	3		1	2	3	0	0	0	0	0	0	0	0	
574	Satwa	Winter	21-Jan-09	17:46:00	19.0	416.8	56	3.09	18	19	47	0.2	3	-2		0	0	0	3	1	1	10	6	1	Manila	Philippines	2.0	0	20	3		1	2	3	0	0	0	0	0	0	0	0	
575	Satwa	Winter	21-Jan-09	17:46:00	19.0	416.8	56	3.09	18	19	47	0.2	4	-2		0	0	1	3	1	1	10	6	1	Manila	Philippines	2.5	0	20	3		1	1	3	0	0	0	0	1	0	0	0	
576	Satwa	Winter	21-Jan-09	17:46:00	19.0	416.8	56	3.09	18	19	47	0.2	4	-2		0	0	1	3	1	1	10	6	1	Manila	Philippines	2.5	0	20	3		1	1	3	0	0	0	0	0	0	0	0	
577	Satwa	Winter	21-Jan-09	17:50:00	19.0	416.8	56	3.09	17.8	19	48.3	0.3	4	-1		-1	0	1	1	3	1	15	0	0	Kerala	India	2.0	0	20	3		2	2	1	0	0	0	0	0	0	1	0	
578	Satwa	Winter	21-Jan-09	17:58:00	19.0	416.8	56	3.09	17.9	19	48.4	0.3	6	-1		0	0	1	3	2	2	15	7	0	Cavite	Philippines	30.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
579	Satwa	Winter	21-Jan-09	18:02:00	19.2	416.8	57	2.57	19.2	19	47.1	0.3	5	-2		0	1	0	5	1	2	10	0	1		India	15.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
580	Satwa	Winter	21-Jan-09	18:07:00	19.2	416.8	57	2.57	17.8	19	48.5	0.3	5	-1		0	1	1	1	4	10	15	7	1	Cochin	India	1.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
581	Satwa	Winter	21-Jan-09	18:12:00	19.2	416.8	57	2.57	18	15	48.8	0.7	4	-2		-1	0	0	3	3	2	10	5	1	Bangalore	India	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
582	Satwa	Winter	21-Jan-09	18:18:00	19.2	416.8	57	2.57	17.7	17	49.6	0.3	5	-1		0	0	1	3	1	1	10	3	1	Bombay	India	20.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
583	Satwa	Winter	21-Jan-09	18:23:00	19.2	416.8	57	2.57	18.1	18	49.4	0.7	4	-1		0	1	1	3	3	2	10	5	1	Kerala	India	2.5	0	20	3		1	1	1	0	0	0	0	1	0	0	0	
584	Satwa	Winter	21-Jan-09	18:30:00	19.2	416.8	57	2.57	17.5	18	50.7	1.2	4	-1		1	0	1	1	1	9	10	5	1	San Juan	Philippines	2.5	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
585	Satwa	Winter	21-Jan-09	18:30:00	19.2	416.8	57	2.57	17.5	18	50.7	1.2	4	-1		1	0	1	1	1	9	10	5	1	San Juan	Philippines	2.5	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
586	Satwa	Winter	21-Jan-09	18:36:00	19.2	416.8	57	2.57	17.3	17	50.4	0.2	4	-1		-1	0	1	3	1	1	10	3	1	Kerala	India	4.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
587	Satwa	Winter	21-Jan-09	18:36:00	19.2	416.8	57	2.57	17.3	17	50.4	0.2	4	-1		-1	0	1	3	1	1	10	3	1	Kerala	India	4.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
588	Satwa	Winter	21-Jan-09	18:46:00	19.2	416.8	57	2.57	17.2	17	49.2	0.3	6	0		0	0	1	3	1	2	10	2	1	Chennai	India	28.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
589	Satwa	Winter	21-Jan-09	18:50:00	19.2	416.8	57	2.57	17.2	18	49.7	0.4	4	0		0	0	1	1	2	2	10	1	0	Karachi	Pakistan	0.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	with tie

Survey Database: Winter – January 22, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
590	SZR	Winter	22-Jan-09	7:30:00	19.8	428.1	51	3.6	16	12	57.3	0.4	4	-1	0	0	1	1	1	1	9	10	3	0	General San	Philippines	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	likes weath
591	SZR	Winter	22-Jan-09	7:40:00	19.8	428.1	42	3.6	12.9	17	62.9	0.6	4	0	0	0	0	1	1	1	1	10	0	0	Chennai	India	10.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	smoking
592	SZR	Winter	22-Jan-09	7:45:00	19.8	428.1	42	3.6	14.4	20	59.8	0.9	4	-1	0	0	0	1	4	2	9	10	0	1	Burishal	Bangladesh	4.5	0	20	3		2	1	1	1	0	0	0	0	0	0	0	hands in p
593	SZR	Winter	22-Jan-09	7:50:00	19.8	428.1	42	3.6	13.2	14	62.5	0.9	4	-1	0	0	0	1	3	2	1	10	5	1	Pangasinan	Philippines	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
594	SZR	Winter	22-Jan-09	7:55:00	19.8	428.1	42	3.6	13	23	62.6	0.3	6	0	0	0	0	1	2	1	9	10	5	1	Beirut	Lebanon	34.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
595	SZR	Winter	22-Jan-09	8:02:00	20.3	428.1	40	4.63	14.6	23	60.7	0.8	5	-2	-1	0	0	0	1	1	1	10	6	1	Pasig	Philippines	1.5	0	20	3		2	1	1	1	0	0	0	0	0	0	0	hands in p
596	SZR	Winter	22-Jan-09	8:02:00	20.3	428.1	40	4.63	14.6	23	60.7	0.8	3	-2	-1	0	0	0	1	1	1	10	6	1	Pasig	Philippines	1.5	0	20	3		2	1	2	1	0	0	0	0	0	0	0	
597	SZR	Winter	22-Jan-09	12:30:00	20.7	428.1	46	4.12	21.4	18	38.4	1.1	5	0	0	0	0	1	1	1	2	13	5	0	Dubai	UAE	7.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	with tie
598	SZR	Winter	22-Jan-09	12:38:00	20.7	428.1	46	4.12	27.2	34	32.7	2.8	5	0	0	0	0	1	3	1	1	15	0	0		Russia	3.0	0	20	3		1	1	1	1	0	0	0	0	0	0	1	
599	SZR	Winter	22-Jan-09	12:42:00	20.7	428.1	46	4.12	25.4	34	33.4	2.8	4	1	0	0	0	1	1	1	2	15	7	1		England	0.0	0	20	3		2	1	3	1	0	0	0	0	0	0	0	
600	SZR	Winter	22-Jan-09	12:57:00	20.7	428.1	46	4.12	32.5	38	28	0.9	4	-1	0	0	0	1	1	1	4	12	8	9	Pampanga	Philippines	9.0	0	20	3		1	1	2	1	0	0	0	0	0	0	1	
601	SZR	Winter	22-Jan-09	13:02:00	20.4	428.1	48	5.14	25.8	20	34	0.7	4	0	0	0	0	1	3	1	2	19	8	1	Amman	Jordan	1.0	0	20	3		1	1	1	1	0	0	0	0	0	0	0	smoking
602	SZR	Winter	22-Jan-09	13:10:00	20.4	428.1	48	5.14	26.3	30	33	1.2	6	0	0	1	0	1	4	1	2	16	5	0		Croatia	1.0	0	20	3		1	1	2	1	0	0	0	0	0	0	1	with tie
603	SZR	Winter	22-Jan-09	13:10:00	20.4	428.1	48	5.14	26.3	30	33	1.2	6	0	0	1	0	1	4	1	2	16	5	0		Sri Lanka	8.0	0	20	3		1	1	2	1	0	0	0	0	0	0	0	
604	SZR	Winter	22-Jan-09	13:16:00	20.4	428.1	48	5.14	25.3	24	35.5	0.9	4	0	0	1	0	1	1	1	2	12	2	1		Tanzania	6.0	0	20	3		1	1	1	1	0	0	0	0	0	0	1	
605	SZR	Winter	22-Jan-09	13:20:00	20.4	428.1	48	5.14	23.5	20	37.6	0.3	3	0	0	0	0	1	5	1	4	19	5	0	Manila	Philippines	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
606	SZR	Winter	22-Jan-09	13:25:00	20.4	428.1	48	5.14	21.4	21	38.8	1.3	4	-1	-1	0	1	1	1	1	2	10	3	0	Kerala	India	8.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
607	SZR	Winter	22-Jan-09	13:30:00	20.4	428.1	48	5.14	27.5	40	31.6	0.7	6	1	0	0	0	1	3	1	2	12	5	0		Canada	1.0	0	20	3		1	2	1	1	0	0	0	0	0	0	1	
608	SZR	Winter	22-Jan-09	13:35:00	20.4	428.1	48	5.14	22.5	21	40	0.2	4	-1	0	0	1	1	3	1	4	19	5	1	Kerala	India	5.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
609	SZR	Winter	22-Jan-09	13:40:00	20.4	428.1	48	5.14	21.8	24	38.3	1.3	4	0	0	0	0	1	3	1	4	19	7	1	Amman	Jordan	1.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	with tie
610	SZR	Winter	22-Jan-09	14:00:00	19.8	428.1	48	4.63	30.6	33	41	0.9	3	0	0	0	0	1	1	1	4	15	0	0	Dubai	UAE	17.0	0	10	2		1	1	2	0	0	0	0	0	0	0	0	listens to n
611	SZR	Winter	22-Jan-09	14:00:00	19.8	428.1	48	4.63	30.6	33	41	0.9	3	0	0	0	0	1	1	1	4	15	0	0	Dubai	UAE	18.0	0	10	2		1	1	2	0	0	0	0	0	0	0	0	listens to n
612	SZR	Winter	22-Jan-09	14:08:00	19.8	428.1	48	4.63	24.5	36	36	1.7	4	0	0	-1	0	1	3	2	4	12	6	1	Tanta	Egypt	5.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
613	SZR	Winter	22-Jan-09	14:14:00	19.8	428.1	48	4.63	23.7	30	35.2	0.3	4	0	0	0	0	1	2	3	2	10	1	1	Kerala	India	4.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
614	SZR	Winter	22-Jan-09	14:18:00	19.8	428.1	48	4.63	23	34	37.1	1.4	5	-1	0	1	0	1	2	1	2	10	1	1	Kerala	India	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
615	SZR	Winter	22-Jan-09	14:27:00	19.8	428.1	48	4.63	23.8	34	35	0.5	5	-1	0	0	0	1	3	2	2	10	1	1	Nairobi	Kenya	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
616	SZR	Winter	22-Jan-09	14:37:00	19.8	428.1	48	4.63	20.8	31	40.4	0.8	4	-1	-1	1	0	1	1	1	2	12	8	1	Manila	Philippines	3.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
617	SZR	Winter	22-Jan-09	18:10:00	19.1	428.1	53	2.57	20.5	19	40.8	0.6	5	0		1	1	1	2	1	2	15	0	0	Kerala	India	13.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
618	SZR	Winter	22-Jan-09	18:15:00	19.1	428.1	53	2.57	19	24	42.1	0.3	5	0		0	0	1	5	2	5	10	1	1	Kerala	India	5.0	0	20	3		1	1	1	0	0	0	0	1	0	0	0	
619	SZR	Winter	22-Jan-09	18:20:00	19.1	428.1	53	2.57	19	24	42.6	0.3	4	1		0	0	1	1	3	1	18	0	0	Quezon City	Philippines	2.0	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
620	SZR	Winter	22-Jan-09	18:25:00	19.1	428.1	53	2.57	19.1	26	43.4	1.5	5	-2		0	0	1	1	1	2	10	4	1	Colombo	Sri Lanka	20.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
621	SZR	Winter	22-Jan-09	18:36:00	19.1	428.1	53	2.57	18.4	26	44.8	0.4	3	-1		0	0	1	2	3	1	10	0	0		Egypt	2.0	0	20	2		2	1	2	0	0	0	0	0	0	0	0	
622	SZR	Winter	22-Jan-09	18:36:00	19.1	428.1	53	2.57	18.4	26	44.8	0.4	4	-1		0	0	1	2	3	1	10	0	0		Egypt	2.0	0	20	2		2	1	2	0	0	0	0	0	0	0	0	
623	SZR	Winter	22-Jan-09	18:40:00	19.1	428.1	53	2.57	18.5	26	44.9	1.9	4	0		1	1	1	3	1	2	10	5	0		India	26.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	smoking
624	SZR	Winter	22-Jan-09	18:40:00	19.1	428.1	53	2.57	18.5	26	44.9	1.9	3	0		1	1	1	3	1	2	10	5	0		Bangladesh	5.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	with headb
625	SZR	Winter	22-Jan-09	18:50:00	19.1	428.1	53	2.57	19.1	26	43	0.3	8	0		1	1	0	1	1	2	10	0	0	Muscat	Oman	40.0	0	20	2		1	1	1	0	0	0	0	0	0	0	0	
626	SZR	Winter	22-Jan-09	19:00:00	17.4	428.1	58	3.09	17.8	26	46	0.6	4	-1	0	0	1	1	4	1	5	15	6	1	Lahore	Pakistan	3.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	

Survey Database: Winter – January 25, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
627	SZR	Winter	25-Jan-09	17:10:00		461.2			17.4	25	39	0.7	4	-1	0	0	0	1	5	2	5	20	7	1	Davao	Philippines	7.0	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
628	SZR	Winter	25-Jan-09	17:10:00		461.2			17.4	25	39	0.7	4	-1	0	0	0	1	5	1	2	20	7	1	Iloilo	Philippines	0.3	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
629	SZR	Winter	25-Jan-09	17:17:00		461.2			17.7	30	39.6	0.7	3	-2	0	-1	0	1	5	1	3	10	6	0	Hyderabad	India	0.1	0	20	3		2	1	1	0	0	0	0	0	0	0	0	with tie
630	SZR	Winter	25-Jan-09	17:20:00		461.2			17.7	33	40.2	1.8	4	0	0	1	0	1	5	3	2	10	0	0	Peshawar	Pakistan	0.1	0	51	3		2	1	1	0	0	0	0	0	0	0	0	
631	SZR	Winter	25-Jan-09	17:27:00		461.2			16.7	30	42.1	2.2	3	-1	0	1	0	1	2	1	2	10	6	0	Pune	India	0.4	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
632	SZR	Winter	25-Jan-09	17:30:00		461.2			17.2	33	42	0.4	4	0	0	1	0	0	5	1	2	10	5	0	Kerala	India	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
633	SZR	Winter	25-Jan-09	17:37:00		461.2			17.6	33	41.2	0.8	3	0	0	-1	1	1	4	1	3	10	7	0	Cairo	Egypt	0.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
634	SZR	Winter	25-Jan-09	17:40:00		461.2			17.5	36	42.3	0.4	4	0	0	0	1	1	4	3	2	10	0	0	Karachi	Pakistan	0.7	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
635	SZR	Winter	25-Jan-09	17:45:00		461.2			17.7	26	42.6	0.8	4	1		-1	0	1	2	3	6	10	0	0		Russia	0.0	0	51	3		1	1	2	0	0	0	0	0	0	0	0	
636	SZR	Winter	25-Jan-09	17:45:00		461.2			17.7	26	42.6	0.8	4	-1		-1	0	0	2	3	6	10	0	0		Russia	0.0	0	51	3		1	2	2	0	0	0	0	0	0	0	0	

Survey Database: Winter – January 24, 2008

ID NO.	Site	Season	Date	Time	Tair-met (deg. Celsius)	Solar Rad.-met (rad.)	RH-met (%)	Wind Speed-met (m/s)	Tair-measured (deg. Celsius)	Tground-measure (deg. Celsius)	RH-measured (%)	Wind Speed-measured (m/s)	Age	Heat	Sun	Wind	Humidity	Comfort	Time_out	Activity_prev	Loc_prev	Reason	Frequency per Week	Summer Attendance	Origin City	Origin Country	Years of Residency	Fasting	Occupation	Education	Wishes	Activity	Sex	Grouping	Sun Exposure	Cold drink	Hot drink	Food	Cap/hat	Turban/katra	Shawl	Sunglasses	Other notes
637	Deira	Winter	24-Jan-09	7:50:00	15.6	342.7	66	2.06	14.5	23	60	0.9	4	-1	-1	1	0	1	3	2	1	10	4	0	Delhi	India	3.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
638	Deira	Winter	24-Jan-09	8:00:00	17.0	342.7	61	4.12	12.1	25	65.4	0.3	5	-1	0	0	1	1	1	2	2	10	5	1	Manila	Philippines	7.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
639	Deira	Winter	24-Jan-09	8:00:00	17.0	342.7	61	4.12	12.1	25	65.4	0.3	5	-1	0	0	1	1	1	2	2	10	5	1	Manila	Philippines	7.0	0	20	3		2	1	2	0	0	0	0	1	0	0	1	
640	Deira	Winter	24-Jan-09	8:07:00	17.0	342.7	61	4.12	12.4	34	65.2	1	6	-2	0	0	0	1	1	1	1	10	7	1	Goa	India	20.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
641	Deira	Winter	24-Jan-09	8:20:00	17.0	342.7	61	4.12	12.6	31	64.5	0.4	4	0	0	0	0	1	3	1	1	10	7	0	Tamilnadu	India	0.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
642	Deira	Winter	24-Jan-09	8:20:00	17.0	342.7	61	4.12	12.5	27	65.5	0.3	3	-2	-1	1	1	1	3	2	1	10	7		Pasig	Philippines	1.0	0	20	3		2	2	1	0	0	0	0	0	0	1	0	
643	Deira	Winter	24-Jan-09	8:25:00	17.0	342.7	61	4.12	11.9	30	65	2.6	5	-1	0	1	0	1	3	2	1	10	7	1	Montalban	Philippines	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	1	
644	Deira	Winter	24-Jan-09	8:30:00	17.0	342.7	61	4.12	12.8	29	63.7	0.9	4	-2	-1	0		1	2	3	1	10	6	1		Philippines	0.6	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
645	Deira	Winter	24-Jan-09	8:35:00	17.0	342.7	61	4.12	13.2	31	63.5	1.9	-1	-1	-1	1	0	1	2	1	1	10	5	1	Quezon City	Philippines	10.0	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
646	Deira	Winter	24-Jan-09	8:40:00	17.0	342.7	61	4.12	13.7	29	63.5	0.4	4	0	1	0	0	1	5	1	1	10	1	1	Lahore	Pakistan	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
647	Deira	Winter	24-Jan-09	8:48:00	17.0	342.7	61	4.12	15.6	34	59.2	0.4	4	-1	-1	1	0	1	2	3	1	10	7	1	Hyderabad	India	4.0	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
648	Deira	Winter	24-Jan-09	8:54:00	17.0	342.7	61	4.12	16.1	32	58.7	0.8	5	-1	0	1	0	1	3	3	1	10	0	0	Bombay	India	8.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
649	Deira	Winter	24-Jan-09	9:02:00	18.4	342.7	44	5.66	15.3	32	58.1	1	4	-1	0	1	0	1	3	2	1	10	7	1	Bombay	India	3.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
650	Deira	Winter	24-Jan-09	9:08:00	18.4	342.7	44	5.66	14.8	33	64	0.8	3	-1	0	0	0	1	3	1	1	10	1	1	Manila	Philippines	1.5	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
651	Deira	Winter	24-Jan-09	9:10:00	18.4	342.7	44	5.66	13.7	27	61.8	2.4	5	-1	0	0	0	1	1	3	1	10	0	0		Philippines	4.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
652	Deira	Winter	24-Jan-09	9:14:00	18.4	342.7	44	5.66	14.4	31	59.4	2.4	5	-1		0	0	1	3	1	1	10	7	0	Manila	Philippines	0.2	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
653	Deira	Winter	24-Jan-09	9:20:00	18.4	342.7	44	5.66	14.6	34	59	0.7	3	-2		1	0	1	1	1	1	10	0	0	Kerala	India	0.1	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
654	Deira	Winter	24-Jan-09	9:29:00	18.4	342.7	44	5.66	13.8	32	61.2	0.3	3	-2		0	0	1	3	2	1	10	5	1	Chittagram	Bangladesh	2.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	
655	Deira	Winter	24-Jan-09	9:35:00	18.4	342.7	44	5.66	15.5	29	57	0.3	7	-1	0	1	0	1	3	2	1	10	1	1	Makati	Philippines	5.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
656	Deira	Winter	24-Jan-09	9:35:00	18.4	342.7	44	5.66	15.5	29	57	0.3	6	-1	0	1	0	1	3	2	1	10	1	1	Cavite	Philippines	1.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
657	Deira	Winter	24-Jan-09	12:20:00	19.0	342.7	45	6.17	20.7	36	43.2	0.4	4	-2	0	1	1	1	2	3	1	10	5	0		Philippines	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
658	Deira	Winter	24-Jan-09	12:24:00	19.0	342.7	45	6.17	26.6	42	37	0.5	5	0	0	0	1	1	3	1	2	10	0	0	Kerala	India	7.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	with tie
659	Deira	Winter	24-Jan-09	12:36:00	19.0	342.7	45	6.17	22	34	39.4	4.4	4	-1	0	0	0	1	2	1	9	10	0	0	Laguna	Philippines	0.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
660	Deira	Winter	24-Jan-09	12:36:00	19.0	342.7	45	6.17	22	34	39.4	4.4	5	-1	0	0	0	1	2	1	9	10	0	0	Manila	Philippines	0.0	0	20	3		1	2	2	0	0	0	0	0	0	0	1	
661	Deira	Winter	24-Jan-09	12:38:00	19.0	342.7	45	6.17	21	37	40.9	0.7	4	-1	0	1	0	1	3	1	9	10	6	0	Manila	Philippines	0.7	0	20	3		1	2	1	0	0	0	0	0	0	0	1	
662	Deira	Winter	24-Jan-09	12:42:00	19.0	342.7	45	6.17	22.5	37	38.8	1.2	4	0	-1	0	0	1	3	2	1	10	7	1	Bangalore	India	3.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
663	Deira	Winter	24-Jan-09	12:48:00	19.0	342.7	45	6.17	20.5	28	41	3.4	5	-1	0	1	0	1	1	2	6	10	0	1	Guadalupe	Philippines	0.7	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
664	Deira	Winter	24-Jan-09	12:53:00	19.0	342.7	45	6.17	25.3	40	35.9	1.6	6	-1	0	1	0	1	2	1	1	10	2	1	Chennai	India	19.0	0	20	3		2	1	1	1	0	0	0	0	0	0	1	
665	Deira	Winter	24-Jan-09	13:00:00	18.9	342.7	41	5.66	21.4	35	39.4	1.1	3	0	-1	1	0	1	2	1	3	10	1	0	Andraprades	India	0.2	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
666	Deira	Winter	24-Jan-09	13:00:00	18.9	342.7	41	5.66	21.4	35	39.4	1.1	4	0	0	1	0	1	2	1	3	10	1	0	Chennai	India	0.2	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
667	Deira	Winter	24-Jan-09	13:05:00	18.9	342.7	41	5.66	20.5	36	41.1	4.2	4	0	0	1	0	1	3	3	1	15	1	1	Gujarat	India	2.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
668	Deira	Winter	24-Jan-09	13:10:00	18.9	342.7	41	5.66	22.5	37	38.9	4.2	4	0	0	1	0	1	1	1	7	10	7	0	Kerala	India	0.3	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
669	Deira	Winter	24-Jan-09	13:20:00	18.9	342.7	41	5.66	22.7	34	40.6	1.2	5	-2	0	1	0	1	3	1	9	10	0	0	Quezon City	Philippines	1.1	0	20	3		2	2	1	0	0	0	0	0	0	0	0	
670	Deira	Winter	24-Jan-09	13:24:00	18.9	342.7	41	5.66	24.5	46	38	0.8	3	0	0	-1	1	0	2	3	1	10	1	1		Thailand	1.5	0	20	3		2	1	1	1	0	0	0	0	0	0	0	
671	Deira	Winter	24-Jan-09	13:27:00	18.9	342.7	41	5.66	27.8	41	34.1	0.8	6	0	0	1	0	1	5	2	3	10	5	1	Goa	India	24.0	0	20	3		1	1	1	0	0	0	0	0	0	0	0	
672	Deira	Winter	24-Jan-09	13:30:00	18.9	342.7	41	5.66	26.2	42	36.4	0.8	4	-1	-1	0	0	1	1	2	1	10	7	1	Cavite	Philippines	7.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
673	Deira	Winter	24-Jan-09	13:40:00	18.9	342.7	41	5.66	23.7	41	38.9	1.2	4	0	0	0	0	1	2	3	1	10	7	1	Manila	Philippines	2.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
674	Deira	Winter	24-Jan-09	13:40:00	18.9	342.7	41	5.66	23.7	41	38.9	1.2	4	0	0	0	0	1	2	3	1	10	0	0	Manila	Philippines	1.0	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
675	Deira	Winter	24-Jan-09	13:46:00	18.9	342.7	41	5.66	22	39	41.2	1.7	6	-1	0	0	0	1	2	2	9	10	8	1	Kerala	India	20.0	0	20	2		2	1	1	0	0	0	0	0	0	0	0	smoking
676	Deira	Winter	24-Jan-09	13:50:00	18.9	342.7	41	5.66	20.4	31	43.1	1.2	4	0	0	0	0	1	5	1	1	10	7	1	Mehdia	Tunisia	1.5	0	20	3		1	2	1	0	0	0	0	0	0	0	0	
677	Deira	Winter	24-Jan-09	17:24:00	17.8	342.7	52	4.12	16.6	26	51.7	2.9	3	-1		0	1	1	1	3	1	10	1	0	Colombo	Sri Lanka	0.7	0	20	3		2	1	2	0	0	0	0	1	0	0	0	
678	Deira	Winter	24-Jan-09	17:24:00	17.8	342.7	52	4.12	16.6	26	51.7	2.9	3	-2		0	1	1	1	3	1	10	0	0	Colombo	Sri Lanka	0.8	0	20	3		2	1	2	0	0	0	0	0	0	0	0	
679	Deira	Winter	24-Jan-09	17:32:00	17.8	342.7	52	4.12	16.3	29	52.2	0.6	4	-1		0	0	1	1	1	1	10	1	1	Rizal	Philippines	1.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
680	Deira	Winter	24-Jan-09	17:40:00	17.8	342.7	52	4.12	16.2	26	52.1	4.5	5	-1		0	0	1	3	2	1	10	5	1	Kerala	India	11.0	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
681	Deira	Winter	24-Jan-09	17:45:00	17.8	342.7	52	4.12	17.2	26	51.2	0.3	3	-2		2	0	1	3	2	1	10	1	1	Rangoon	Myanmar	0.2	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
682	Deira	Winter	24-Jan-09	17:45:00	17.8	342.7	52	4.12	17.2	26	51.2	0.3	4	-2		2	0	1	3	2	1	10	1	1	Rangoon	Myanmar	0.2	0	20	3		1	1	2	0	0	0	0	0	0	0	0	
683	Deira	Winter	24-Jan-09	17:55:00	17.8	342.7	52	4.12	15.7	29	56.1	2	6	0		0	0	1	5	2	5	10	1	1	Rajstan	India	2.0	0	20	3		2	1	2	0	0	0	0	1	0	0	0	
684	Deira	Winter	24-Jan-09	17:55:00	17.8	342.7	52	4.12	15.7	29	56.1	2	3	-1		2	0	1	5	2	5	10	1	1	Hyderabad	India	1.0	0	20	3		2	1	2	0	0	0	0	1	0	0	0	
685	Deira	Winter	24-Jan-09	18:00:00	17.3	342.7	54	3.09	15.8	32	52.3	4.3	4	-1		1	0	0	3	3	1	10	1	0	Bicol	Philippines	0.5	0	20	3		2	1	1	0	0	0	0	0	0	0	0	
686	Deira	Winter	24-Jan-09	18:07:00	17.3	342.7	54	3.09	15	32	58.1	6	4	-2		2	0	0	2	3	1	10	0	0	Manila	Philippines	1.0	0	20	3		1	2	2	0	0	0	0	0	0	0	0	
687	Deira	Winter	24-Jan-09	18:07:00	17.3	342.7	54	3.09	15	32	58.1	6	4	-2		2	0	0	2	3	1	10	0	0	Manila	Philippines	1.0	0	20	3		2	2	2	0	0	0	0	0	0	0	0	
688	Deira	Winter	24-Jan-09	18:12:00	17.3	342.7	54	3.09	15	32	60	6	7	-1		1	0	1	2	1	6	10	0	0	Manila	Philippines	1.0	0	20	3		2	1	1	0	0	0	0	1	0	0	0	
689	Deira	Winter	24-Jan-09	18:17:00	17.3	342.7	54	3.09	14.9	35	61.4	2	4	-2		1	0	0	3	1	1	10	5	1	Manila	Philippines	2.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
690	Deira	Winter	24-Jan-09	18:17:00	17.3	342.7	54	3.09	14.9	35	61.4	2	4	-1		1	0	0	3	1	1	10	5	1	Manila	Philippines	3.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
691	Deira	Winter	24-Jan-09	18:17:00	17.3	342.7	54	3.09	14.9	35	61.4	2	4	-2		1	0	0	3	1	1	10	5	1	Manila	Philippines	2.0	0	20	3		2	2	3	0	0	0	0	0	0	1	0	
692	Deira	Winter	24-Jan-09	18:17:00	17.3	342.7	54	3.09	14.9	35	61.4	2	4	-1		1	0	0	3	1	1	10	5	1	Manila	Philippines	2.0	0	20	3		2	1	3	0	0	0	0	1	0	0	0	
693	Deira	Winter	24-Jan-09	18:28:00	17.3	342.7	54	3.09	14.4	30	65.5	0.4	4	-2		1	0	0	5	2	9	10	7	0	Kerala	India	4.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
694	Deira	Winter	24-Jan-09	18:28:00	17.3	342.7	54	3.09	14.4	30	65.5	0.4	5	-2		1	0	0	5	2	9	10	7	0	Kerala	India	6.0	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
695	Deira	Winter	24-Jan-09	18:28:00	17.3	342.7	54	3.09	14.4	30	65.5	0.4	5	-2		0	0	0	5	2	9	10	7	0	Kerala	India	0.7	0	20	3		2	1	3	0	0	0	0	0	0	0	0	
696	Deira	Winter	24-Jan-09	18:34:00	17.3	342.7	54	3.09	13.8	33	68.1	0.7	6	-1		0	0	1	3	2	5	19	0	0	Kerala	India	10.0	0	20	3		2	1	2	0	0	0	0	1	0	0	0	

Appendix G: Overall Distribution of Votes

Table G.1: Heat Vote

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very cold	38	5.5	5.5	5.5
	cold	135	19.4	19.4	24.9
	neither cool nor warm	395	56.8	56.8	81.6
	warm	75	10.8	10.8	92.4
	very hot	53	7.6	7.6	100.0
	Total	696	100.0	100.0	

Table G.2: Sun Vote

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	you'd prefer more	21	3.0	4.0	4.0
	OK	427	61.4	81.5	85.5
	too much sun	76	10.9	14.5	100.0
	Total	524	75.3	100.0	
Missing	System	172	24.7		
Total		696	100.0		

Table G.3: Wind Vote

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	stale	28	4.0	4.0	4.0
	little wind	123	17.7	17.7	21.7
	OK	435	62.5	62.5	84.2
	windy	105	15.1	15.1	99.3
	too much wind	5	.7	.7	100.0
	Total	696	100.0	100.0	

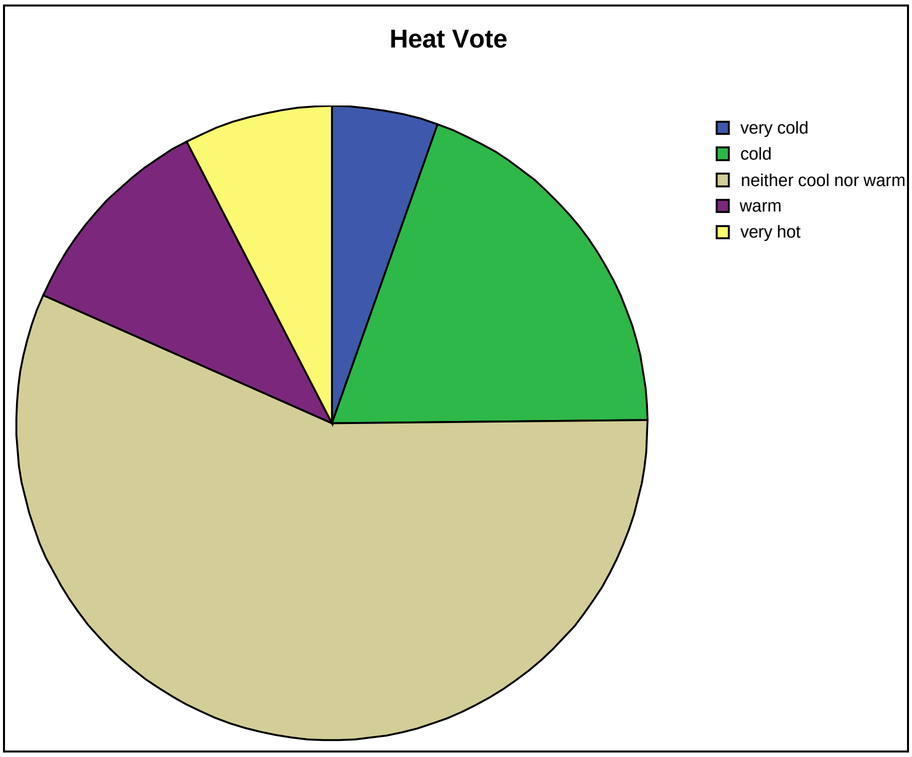
Table G.4: Humidity Vote

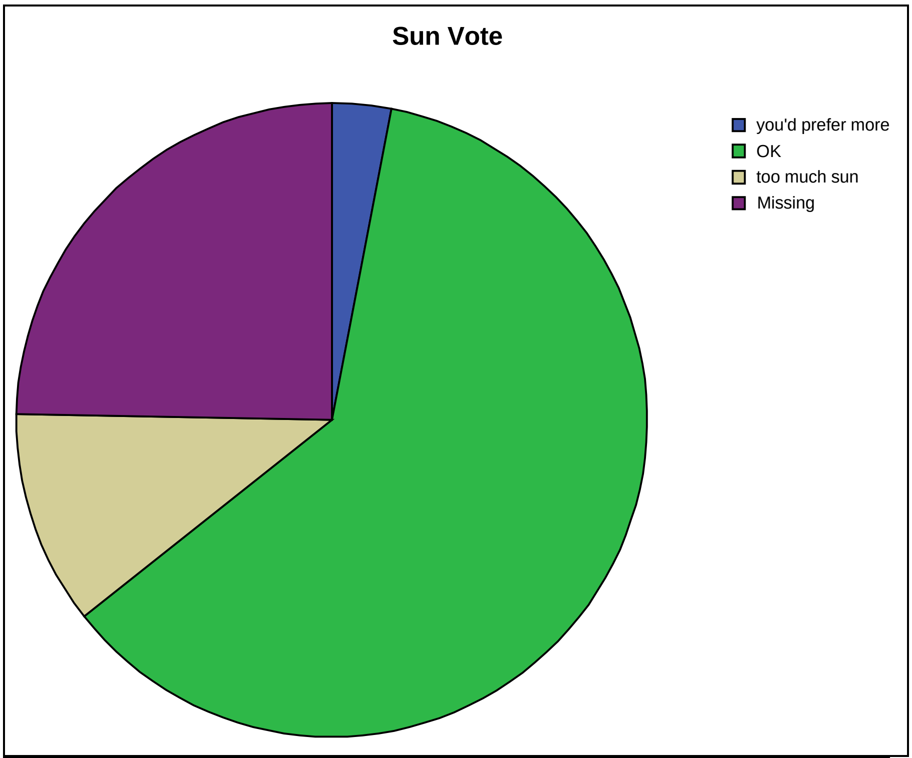
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	damp	97	13.9	14.0	14.0
	OK	497	71.4	71.6	85.6
	dry	100	14.4	14.4	100.0
	Total	694	99.7	100.0	
Missing	System	2	.3		
Total		696	100.0		

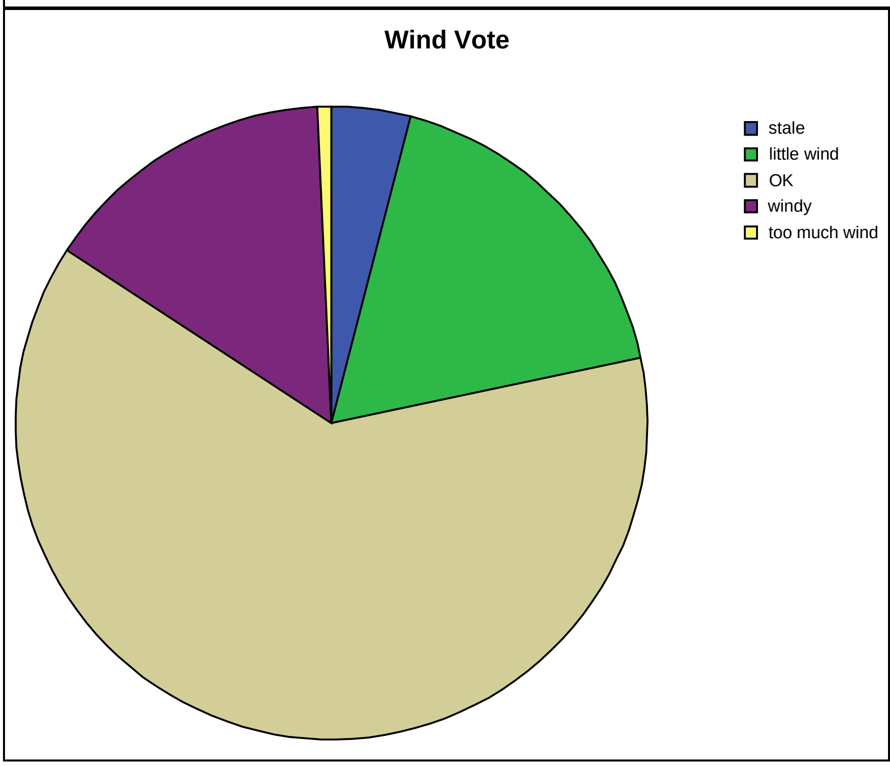
Table G.5: Comfort Vote

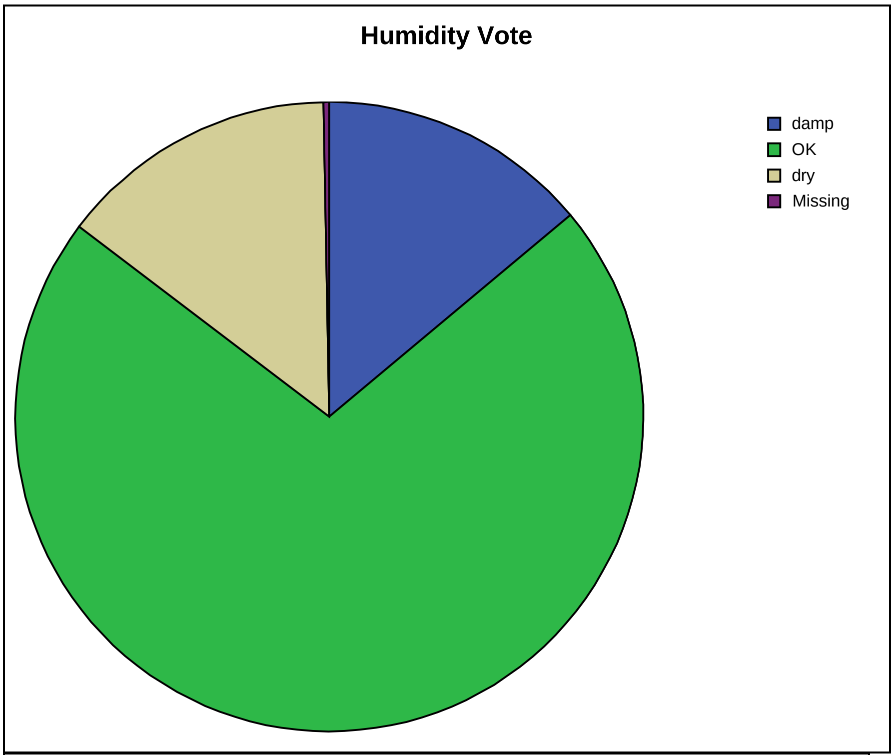
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	126	18.1	18.1	18.1
	yes	570	81.9	81.9	100.0
	Total	696	100.0	100.0	

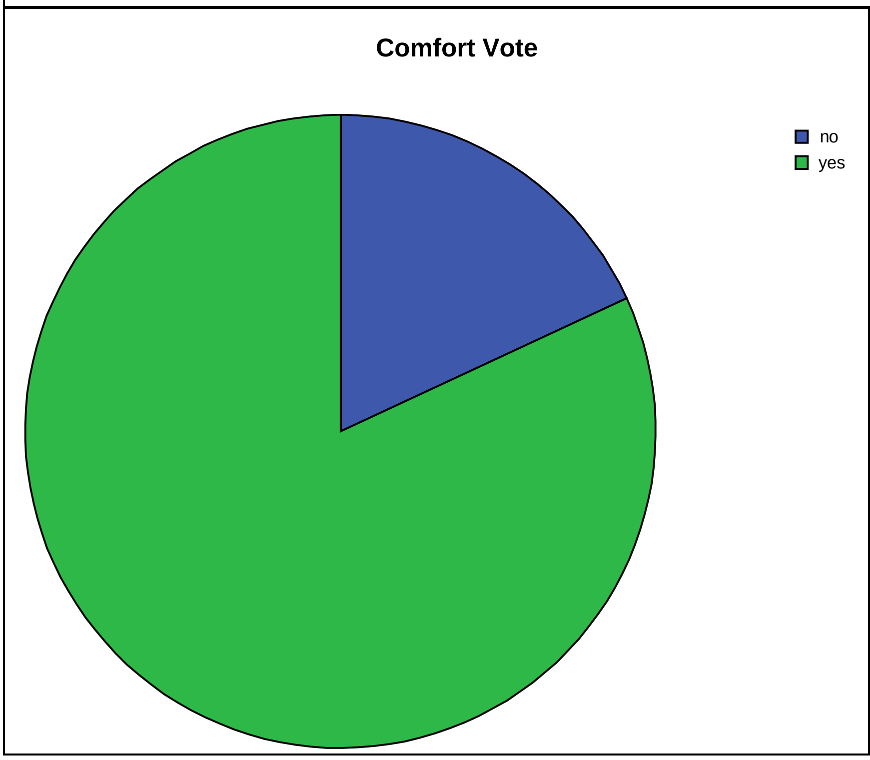
Pie Charts - Overall Votes




Sun Vote
you'd prefer more
OK
too much sun
Missing


Wind Vote
stale
little wind
OK
windy
too much wind


Humidity Vote
damp
OK
dry
Missing


Comfort Vote
no
yes

Votes Per Season

Table G.6: Comfort Votes Per Season

	Season					
	Summer		Autumn		Winter	
	Comfort Vote		Comfort Vote		Comfort Vote	
	Count	%	Count	%	Count	%
no	84	(35.9%)	13	(5.5%)	29	(12.8%)
yes	150	(64.1%)	222	(94.5%)	198	(87.2%)

Table G.7: Heat Votes Per Season

	Season					
	Summer		Autumn		Winter	
	Heat Vote		Heat Vote		Heat Vote	
	Count	%	Count	%	Count	%
very cold					38	(16.7%)
cold			22	(9.4%)	113	(49.8%)
neither cool nor warm	119	(50.9%)	204	(86.8%)	72	(31.7%)
warm	62	(26.5%)	9	(3.8%)	4	(1.8%)
very hot	53	(22.6%)				

Table G.8: Sun Votes Per Season

	Season					
	Summer		Autumn		Winter	
	Sun Vote		Sun Vote		Sun Vote	
	Count	%	Count	%	Count	%
you'd prefer more			6	(3.2%)	15	(9.2%)
OK	111	(63.8%)	172	(92.0%)	144	(88.3%)
too much sun	63	(36.2%)	9	(4.8%)	4	(2.5%)

Table G.9: Wind Votes Per Season

	Season					
	Summer		Autumn		Winter	
	Wind Vote		Wind Vote		Wind Vote	
	Count	%	Count	%	Count	%
stale	27	(11.5%)	1	(.4%)		
little wind	73	(31.2%)	22	(9.4%)	28	(12.3%)
OK	131	(56.0%)	178	(75.7%)	126	(55.5%)
windy	3	(1.3%)	34	(14.5%)	68	(30.0%)
too much wind					5	(2.2%)

Table G.10: Humidity Votes Per Season

	Season					
	Summer		Autumn		Winter	
	Humidity Vote		Humidity Vote		Humidity Vote	
	Count	%	Count	%	Count	%
damp	89	(38.2%)	6	(2.6%)	2	(.9%)
OK	132	(56.7%)	193	(82.1%)	172	(76.1%)
dry	12	(5.2%)	36	(15.3%)	52	(23.0%)