

LIFESTYLES FOR A NEW MOBILITY IN DELHI

– AN EMPIRICAL SURVEY ON THE INFLUENCE OF DIFFERENT PARAMATERS ON MOBILITY IN DELHI

1. COGNITIVE INTEREST

“New Mobility” concepts are discussed and introduced in many parts of the world. Especially the development of public bicycle sharing systems feature an enormous dynamic and future growth potential. Many cities in Europe have started to implement them as the missing link between high capacity but low flexibility public transport and personal door to door connectivity. In Asia as well the first bicycle sharing systems have popped up recently – under totally different circumstances though. Whereas in many societies in the West the public discourse about climate change and sustainability as well as the perception that too many cars destroy urban life has started to accelerate the use of bicycles in many urban areas, Asian cities experience an enormous rate of motorization. Here the bicycle is generally considered a poor man's vehicle, an image which contradicts the public desire for rapid technological and economical progress. Hence the question rises whether public bicycle sharing systems in Asia are subject to the same kind of positive image and acceptance by the local citizens like in European cities.

In the particular example of Delhi, common sense among planners and bureaucrats let assume that whoever is able to afford it will substitute public transport or cycling by motorized individual transport (MIT). Hence transportation planning predominantly aims at smoothing the latter. The construction of flyovers has a higher priority than the construction of cycle lanes for example. Nevertheless, there is a growing number of people who despite their wealth are featuring a more multi-modal mobility pattern including the use of bicycles. Taking this into account, I challenge the mono-causality of higher income leading inevitably to exclusive car use. My hypothesis is that a multi-modal mobility is a function of values, attitudes and lifestyles rather than income. The intention of this work is to introduce the lifestyle concept as a tool to identify potential target groups for cycling and bicycle sharing as well as to assess the explanatory power of this approach in comparison with other parameters. I will examine in how far lifestyle as well as income, age and gender are correlated with multi-modality among people having the opportunities of choice between different modes of transport.

From the Indian experience it is obvious that decision makers are much more open for the necessities of the affluent middle class than for the urban poor. An empirical validation of my hypothesis supports the argumentation for a stronger focus on cycling infrastructure as it not only serves the urban poor but also stimulates the potential for cycling among the urban middle class. By laying special focus on the newly established public bicycle rental system in Delhi (PlanetGreenBikes), this exercise also examines target groups for “new mobility” concepts and concludes with necessary steps to be taken to address these potential users.

2. METHODOLOGY OF THE SURVEY

2.1 Theoretical Background

Before I comment on the methods I applied to obtain my results, I have to elaborate briefly on the theoretical background of the lifestyle concept which lies at the center of my empirical work. Starting in the 1980s several European sociologists, among which the most prominent are *Ulrich Beck* and *Anthony Giddens*, reconceptualized social phenomena apparent in the societies of the West. The dramatic change of the economy and labor structure since the beginning of the industrialization accelerated the shift from heteronomy towards self-determination of an individual's life. With the occurrence of new forms of differentiated labor conditions this process gained further importance especially from the 1950s on. Following *Becks* terminology, for the last decades developed societies were characterized by an increasing individualization of social conditions.¹ Traditional class typologies like bourgeoisie, working class, etc. lost their explanatory content, because traditional and stable interrelations between individual behavior and social characteristics were weakened or dissolved. *Beck* explains this dissolution of traditional biographies by three components related to the labor market – education, mobility and competition.² The extended education leads to a substitution of traditional orientations, ways of thinking and lifestyles by a more universal content of knowledge. With a higher education level processes of self-determination and individual self-reflection emerge. With entering the labor market people are determined by mobility processes which challenge their way of life within their traditional environment. Besides, people are exchangeable due to their common degrees, so everybody is obliged to present himself as some outstandingly unique individual in order to remain competitive. These three interdependent components were responsible for the accelerated individualization process of the last five decades.

In today's post-modern society with radical economical and political changes *Giddens* and *Beck* attest a new quality of this phenomena. With an increasing compulsion to conduct a reflexive lifestyle, to explore one's individual identity and sense of life, the individualization of lifestyles increases further. As the traditional categorization of society in classes and feudal orders does not sufficiently describe the complexity of the post-modern society, these typologies have been substituted by manifold lifestyle- or milieu-typologies.³ Following *Pierre Bourdieu's* discussion about the construction of social space and the concept of habitus, lifestyles can be defined as

“a form of practices produced by the respective habitus as systematic configurations of features and characteristics and an expression of differences in tastes and preferences.”⁴

A particular relevance is added to this concept of lifestyle by its splendid utilization for marketing purposes. In this context a more consume oriented lifestyle definition is offered:

¹ cf. BECK (1986), pp. 206-210

² cf. BECK (1983), pp. 40-42

³ cf. GEIBLER (2002), HORLEY, CARROL and LITTLE (1987), SCHULZE (2000), FLAIG and UELTZHÖFFER (1980)

⁴ Translated from the author after BOURDIEU (1984), pp. 277-284

“Lifestyle marks the characteristic (sub-)cultural behavior patterns of individuals and social groups. Lifestyle embodies the value orientation of consumers.”⁵

Here the individual attitudes and value orientations thicken to a particular consumption pattern, which is targeted at with lifestyle specific marketing strategies. I mention this perspective because the lifestyle typology I am applying in my empirical work is fundamentally a consumer oriented approach. In terms of mobility, the concept of “*Mobilitätsstile*” (mobility-styles) has been developed, closely connected to the lifestyle classification.

“For behavioral orientations [as an individual's mobility definitely is (the author)], the underlying assumption is that there is always a symbolic dimension to where and how one moves, which in turn demonstrates one's affinity to a particular lifestyle group.”⁶

In this respect the classical factors for an explanation of traffic behavior like gender, age, income, etc. are connected with other more individualistic characteristics like attitudes, values and preferences.

In India neither of these lifestyle approaches have any prominence yet. Common classification systems are based on religious and linguistic grounds, both determining strong feelings of communalism among Indians. Another common classification system is represented by the caste system. Although it was officially applied for the last time in the Census 1931 and thereafter declared illegal by the newly established Republic of India, this millennia-old system still maintains relevance in every day's life. This gets obvious when analyzing migration patterns. People of same regional origin, same religious background or same caste tend to live together. Matrimonials of newspapers mostly include caste and sub-caste as a distinctive feature of the bride/groom in spite and inter-caste marriages are still taboo among many families. Based on the 1931 Census data Scheduled Castes, (SC)⁷, Scheduled Tribes (ST) and Other Backward Casts (OBC) benefited from a complex quota system on public jobs. By providing reservations the government was eager to alleviate the extreme income differences between the different sections of society and to offer opportunities for upward mobility. Apart from individual success stories this system has failed to improve the situation of millions of *dalits* in general. With intensive rural-urban migration and the breakout from their traditional village value system, the acerbity of this discriminatory system has softened to a certain extent among urban citizens but still remains valid. It is still a social reality which determines one's social status and the limits of the social relations and also opportunities for advancement in the life of an individual.⁸

Being a concept developed in the West, the lifestyle model has its limitations in a society like India. Following modernization theories it can be applied to urbanized parts of the society, that means to people

⁵ Translated from the author after the Marketing Lexikon (2009): http://www.marketing.ch/lexikon_detail.asp?id=610 (visited 19.12.2009)

⁶ Translated from the author after GÖTZ and OHNMACHT (2009), p. 2

⁷ Official expressions for the “Untouchables”, “Dalits” or “Children of God”. These lowest casts traditionally were employed in filthy and unclean activities like cleaning latrines, doing tannery work, etc.

⁸ The Indian Government had to succumb under political pressure to include caste in the 2011 Census after 64 years of constitutional ban

who have discarded their village background and adopted a lifestyle based on individual choices. Remaining in the village context an individual is forced to absorb the restrictive, culturally determined value orientations of his community. Taking these considerations into account a lifestyle model might add explanatory content to the pluralizing and individualizing urban society in India, but not to the Indian society in general.

2.2 Introduction of the applied lifestyle model (Roper Consumer Styles© by GfK)

Many different lifestyle classification models have been developed, mainly by European sociologists. All models are based on the same kind of underlying theoretical background. The working premises are their consideration of significant trends of pluralization and individualization of developed societies based mainly on the work of *Ulrich Beck*. The most well known model in the German context is the Sinus-Milieu model developed by Sinus Sociovision, which classifies society after the socio-economic background and the underlying fundamental orientations. Empirical studies about mobility patterns and sinus-milieus shows the significance of the lifestyle approach for mobility in developed societies.⁹ The main disadvantage of the Sinus-Milieu model rests upon its spatial limitation. As the classification includes German Democratic Republic-nostalgics for example, it is not simply transferable to other countries. For my work another decisive limitation emerges. Because the model-immanent theories of pluralization and individualization were developed to explain social trends in late-modern developed societies, the question rises in how far these theories are valid in developing, rapidly changing societies like the Indian. As processes of individualization and pluralization of society generally are a side effect with economic development, my hypothesis is that these trends become visible in the Indian urban middle class likewise.

In order to validate this hypothesis I have chosen to apply a lifestyle model which has been used and tested in India already. The Roper Consumer Styles (RCS)© model from the *Deutsche Gesellschaft für Konsumforschung* (GfK), based conceptionally on the work of the Israeli sociologist *Shalom Schwartz*, claims to be valid worldwide among the urbanized middle-classes.¹⁰ In reference to global validity GfK points out that there is

*“no uniform global consumer pattern, but a global superordinate system of basic and consume relevant value orientations in which social groups with distinct Weltanschauungen (philosophies of life), convictions, buying behaviors and communication patterns compact into characteristic lifestyles.”*¹¹

Values in this context can be defined as:

*“States of the individual or corporative life, which are regarded specifically important or desirable. Guidelines for behavior and superordinate units of orientation.”*¹²

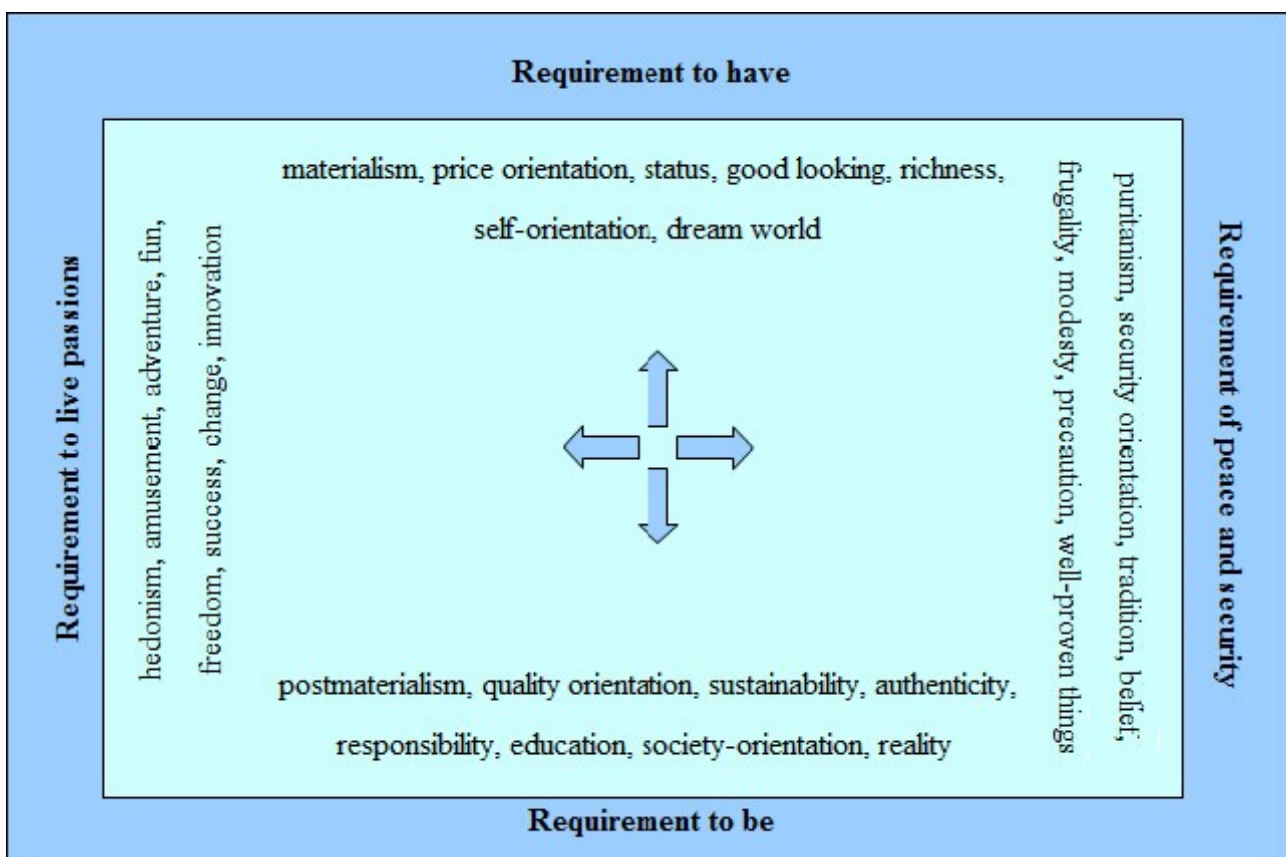
⁹ cf. BECK and PLÖGER (2008), GÖTZ and OHNMACHT (2009)

¹⁰ cf. SCHWARTZ (1992) and SCHWARTZ et al. (2001)

¹¹ PEICHL, GfK (2009) quoted from a presentation for the Marketingclub Dresden from 12.03.2009. Online under: <http://marketingclub-dresden.de/downloads/gfk-wertetrends-und-Lebensstile.pdf> (13.12.2009)

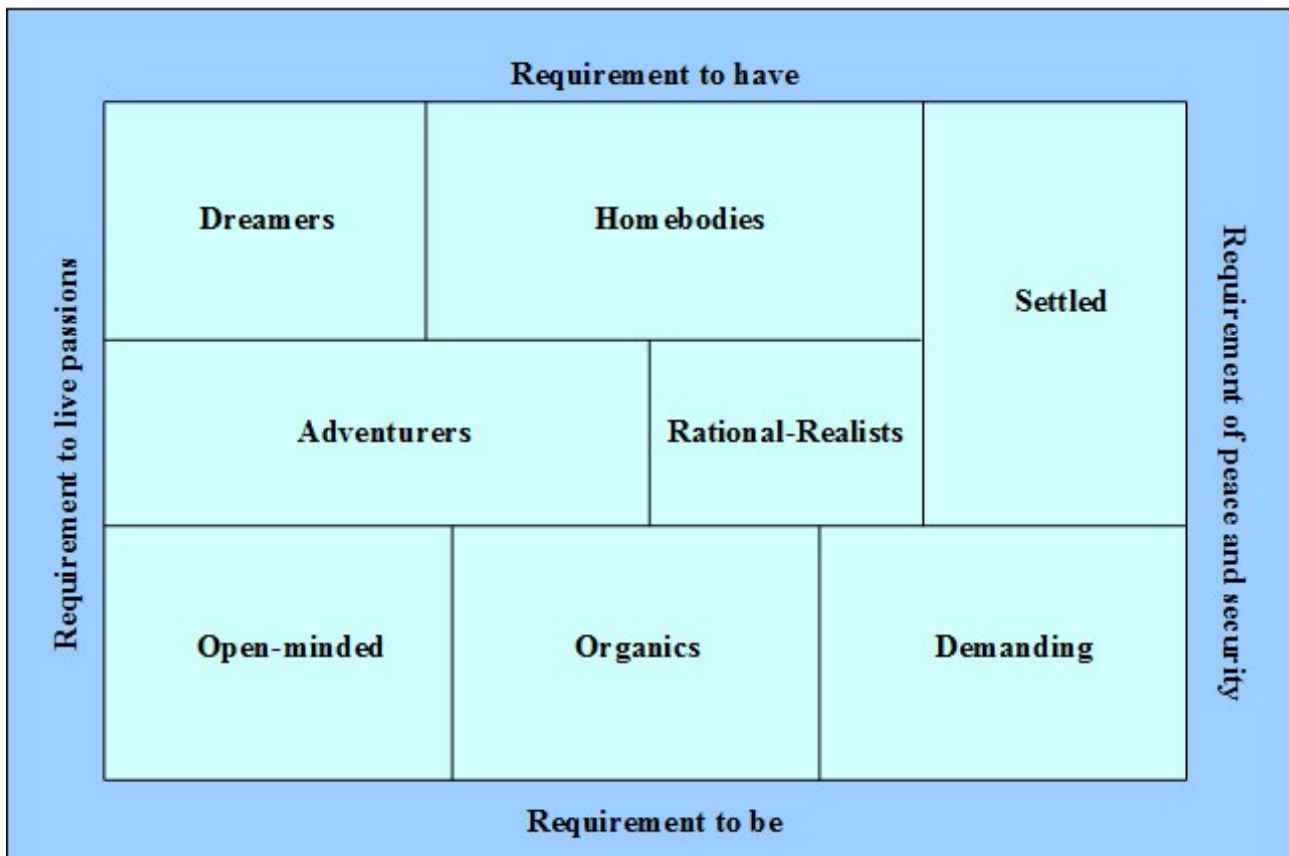
¹² DUNCKER (2000) quoted from http://www.holzhauei.de/downloads/vortrag_werte.pdf (visited 14.12.09)

In the context of developing societies the validity of the concept is limited to an urban society excluding the poorest section of society. These requirements are necessary because first, in rural areas of developing countries the penetration of diversified consumer goods is not high enough for people to emerge value based consumption preferences and second, a precondition for people to emerge a distinct lifestyle is the satisfaction of basic needs. People living in absolute poverty do not have the monetary capacity to emerge distinctive consumption patterns. In contrast to the Sinus-Milieu model the RCS© model does not incorporate socio-economic parameters into the model. It rather handles lifestyle as a function of consumption. By constructing a 2x2 matrix of opposing value orientations, individual consumption is determined by the degree of materialistic versus post-materialistic value orientations and the requirement to live passions versus the requirement for peace and security, respectively. Taking into consideration a certain income level to generate a distinct lifestyle oriented consumer pattern and the availability for access to a differentiated product range, each individual can thus be classified within the following structural map:



Based on these superordinate value orientations eight distinctive lifestyles or Roper Consumer Styles © have been developed. How each of these are located within this structural map of value orientations is shown in image 2. The descriptions for each of these lifestyles have been provided by GfK.¹³

¹³ PEICHL, GfK (2009), slides 22-27



Settled:

People of this lifestyle are indigent for harmony and security, modest and duteous. Order and routine is highly valued.

Homebodies:

They are searching for social recognition within their local environment. Traditional values like faith, honesty, family, security and frugality are dominant. People characterized as homebodies tend to emerge a materialistic but price-conscious consume pattern aligned to functionality.

Dreamers:

Members of this category are dreaming of the big luck. They are intuitive, young materialistic people who dream of the world of stars and celebrities and try to chase a place in the sun. They demand brands with a strong image and are always searching for a good bargain.

Adventurers:

They are people who are living passions. They are young, dynamic people searching for success and material independence. Demonstrative consume directed towards leisure and innovation is a characteristic of Adventurers. Thus they become trend setters for new products and ideas.

Open-minded:

The Open-minded can be located between self-fulfillment, social responsibility and amusement. They are hedonistic, tolerant intellectuals, who are searching for individuality and personal harmony. They feature an upmarket consume style aligned to lifestyle and ambiance.

Organics:

Organics are searching for sustainability and intellectual enrichment. They are committed families with denomination towards environment and society, without neglecting the convenient side of life. Rational consume aligned to high quality and sustainability is preferred by them.

Rational-Realists:

Rational-Realists are hard working people with and respect for nature. They are critical, committed and intellectual couples, who pursue a livable future. In terms of consume they spend much time on searching for brands which fulfill their high standards.

Demanding:

They are rooted in conservative values and consider family reputation and harmony as very important. They live an elitist consume style with strong meaning of status and recognition.

GfK classifies the total population into these eight distinct lifestyle groups based on a set of 26 values, eight interests and six activities. In order to do so a discriminant analytic model is applied where every respondent receives a weighted value for each of the eight lifestyle groups. These weighting parameters have been detected in representative baseline studies carried out by GfK. The highest score determines the lifestyle affiliation.

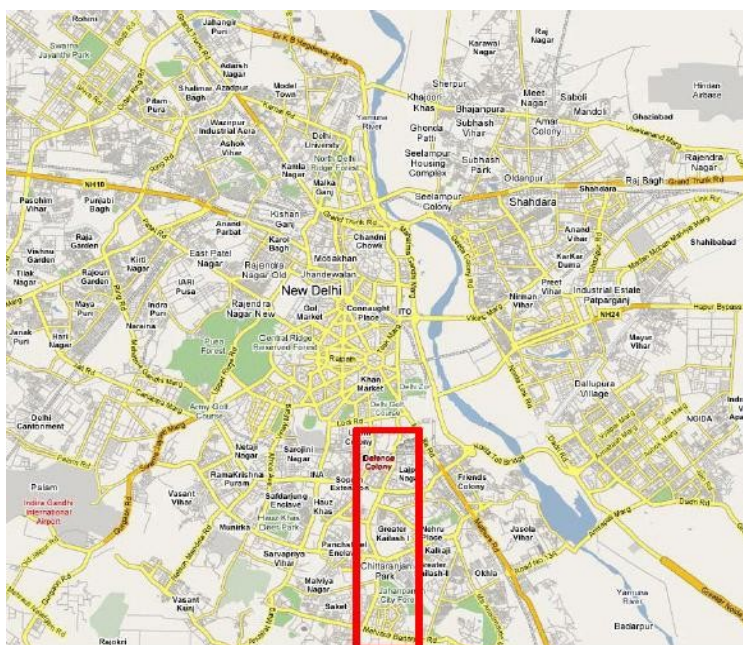
Applying this consumerist concept in order to evaluate the potential for a sustainable transportation system from a lifestyle perspective, mobility and infrastructural elements of a sustainable urban transportation system have to be perceived as a publicly provided product which is or is not consumed by the citizens and which should be marketed target group specifically. This will be one of the working premises of this work.

2.3 Identifying the total population of the survey

As the consumption of different choices depends on the availability of them and I am particular interested in how far lifestyle determines the mobility pattern, I have to rely on people to whom different choices of mobility are available. Different mobility choices demand for the possibility of using one's own vehicle plus an appropriate offer of public transport services. In Delhi, the newly established BRT-corridor intends to offer an improved public transport with priority lanes for buses and with new low floor and partly air conditioned buses offering a better comfort. Besides, the concept of BRT in Delhi includes separated lanes for pedestrians and cyclists. Finally, the public bicycle rental system along the BRT-corridor widens the mobility opportunities for a multi-modal mobility. Thus I chose the BRT-corridor as the product which

increases the mobility choices of the residents living in vicinity to it. For that reason I have decided to choose a sampling design based predominantly on spatial considerations. Following and adjusting the idea of the gravity model of traffic¹⁴, I assume that people living in close vicinity to the BRT-corridor are mostly affected by it, whereas the amount of people using this road frequently decreases significantly with the distances of origin/destination rising. Following this idea I carried out a household survey where the total population of the survey shares the common feature of living in proximity to the BRT-corridor. Thus I avoid distorting the results by questioning people on the street who might be encountered in the particular area just by chance and who are not able to evaluate the infrastructural elements of the BRT-corridor properly. To ensure the highest gravitational pull by the BRT I limited my total survey area to a buffer of 1 km around the BRT-corridor.

Although the total BRT-corridor stretches to the north until Delhi Gate, the areas north of Jangpura are not



Overview of Delhi and location of the BRT-corridor

densely inhabited. The territory along the BRT-corridor belonging to NDMC are covered by luxury hotels, golf courses, stadiums, monuments and the zoo. Apart, the northern part of the BRT-corridor is not fully operational as it does not feature fully segregated bus lanes yet. These reasons limit my survey area significantly to the area south of Mathura Road/ Lodi Road Junction.

My particular research question demands for another decisive precondition. Following the RCS© lifestyle model it is assumed that for people to establish a certain lifestyle detectable by consumer

choices, they have to have satisfied their basic needs and are equipped with extra funds for their free disposal. Taking into account the enormous amount of private motorized vehicles in Delhi, a more sustainable urban traffic, apart from providing access for the urban poor, has to offer possibilities for vehicle owners to shift their mode of transport. As the level of acceptance of the latter is the main focus of this work, a precondition is that the survey respondents have the economic capability of owning a motorized vehicle. Hence, people without the financial assets to own their own (motorized) vehicle are not the target group for my survey. That allows for an exclusion of the lowest income group of society.

Bearing this in mind, I excluded residential areas from the 1 km buffer area, which are characterized by a substantial amount of Jhuggis-Jhopris¹⁵ or other buildings with poor standards compared to the average housing standard of Delhi. That does not mean that all residents living in those sub-standard housing units are unable to afford motorized vehicles. Although even urban slums in India accommodate people who are endowed with those funds, generally the share of people living below the poverty line is much higher here.

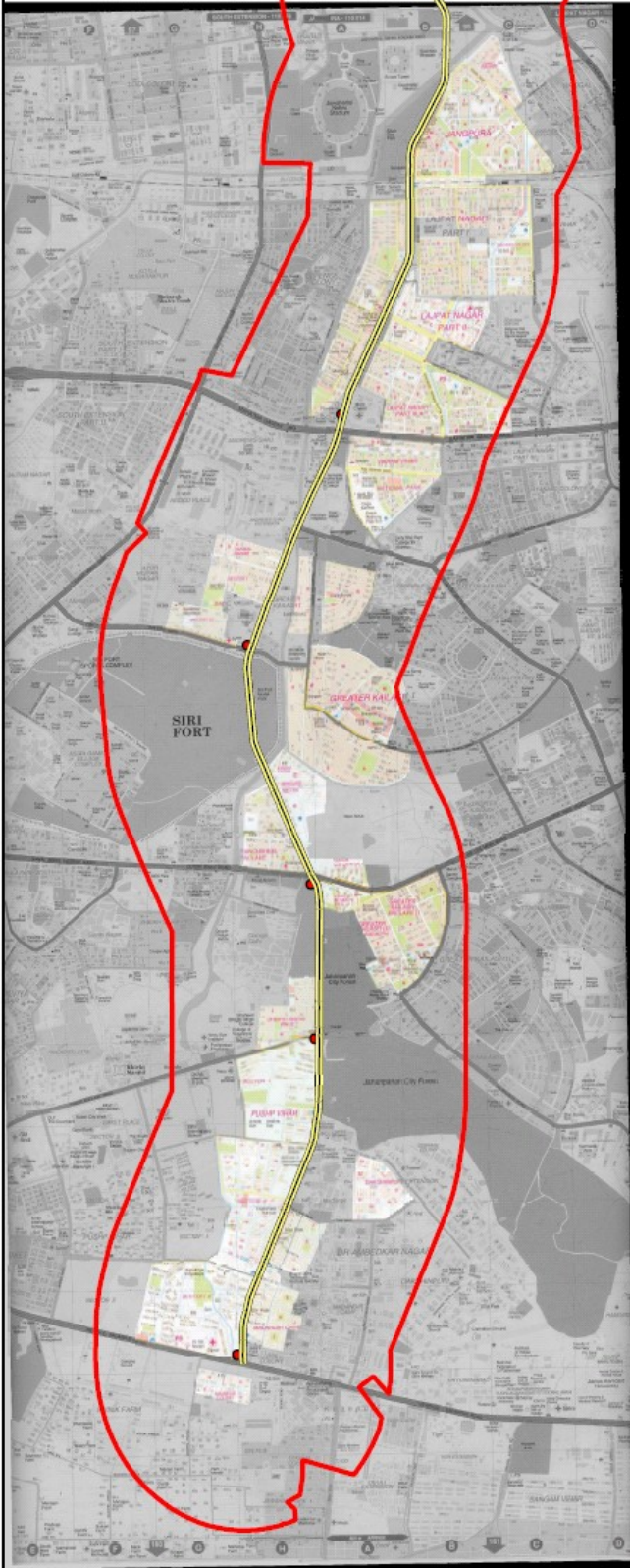
¹⁴ cf. HEINEBERG (2004), pp. 213-215

¹⁵ Sub-standard, mostly unauthorized housing unit in an high density area




As a result, I identified colonies which have as minimum requirements a majority of solid housing units within the total survey area.

For the sake of practicability I furthermore excluded colonies and blocks within colonies, which only partially lie within the 1 km buffer or which are closer to another parallel arterial road. This restriction applies to Defence Colony block A,B,C for example. Some areas within the buffer are not directly connected to the BRT but to the Outer Ring Road and Ring Road. Here the likelihood for the residents is much less to commute the BRT frequently, so I excluded colonies like Soami Nagar, Andrew Ganj and Pushp Vihar Sector 5 as well. The colored areas of image 4 represent the identified residential areas based on these criteria.

Total Survey Area

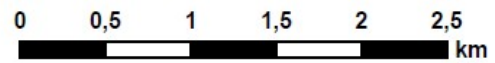


Legend

-  BRT-Corridor
-  Bike rental stations
-  1000m radius around BRT

Total survey area is based on an intersection of ward boundaries with a 1000m beeline buffer around the BRT-corridor.

Sources: Eicher City Map Delhi, 2008
Road Shapefile and Ward Shapefile no metadata available



3. MOBILITY PATTERN AND LIFESTYLES – RESULTS OF THE HOUSEHOLD SURVEY

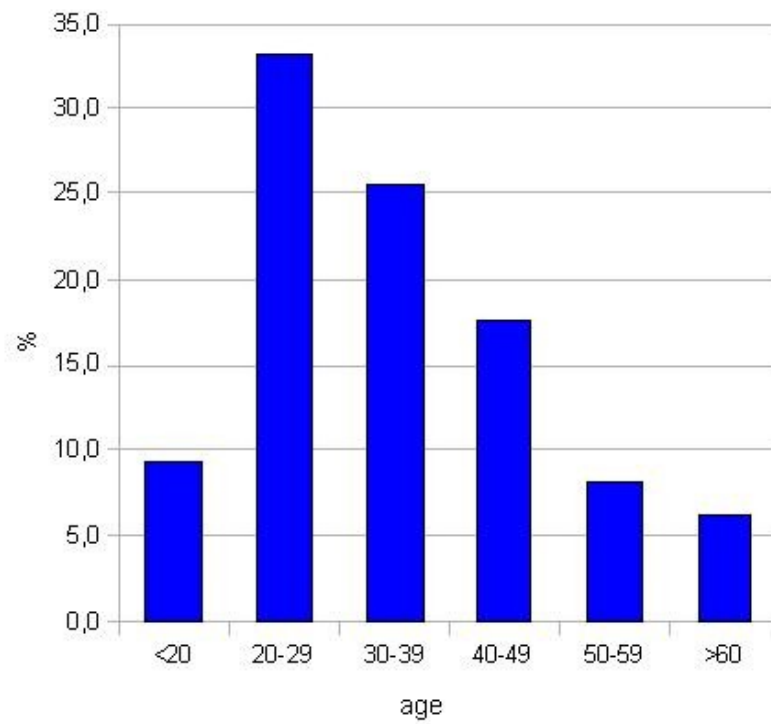
Following the RCS© model, I subdivided the total number of 470 respondents into eight different lifestyle groups. Based on my empirical findings I will first reflect upon the composition of the sample data in terms of age, income, education and gender distribution, and after that characterize the eight lifestyle groups by these parameters.

The graphics in the following chapter show the general distribution of each parameter (age, income, education level and gender) of the 470 respondents. Subsequently, I computed the deviations of each lifestyle group for each parameter to assess common characteristics among the eight lifestyle groups. I want to detect how the different lifestyle groups from my survey are constituted socio-economically.

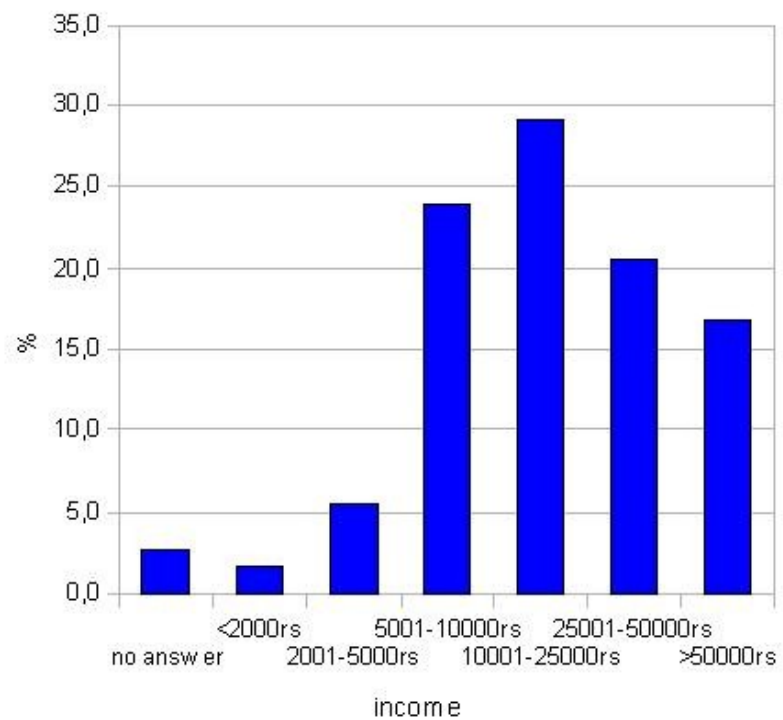
3.1 Description of the sample composition

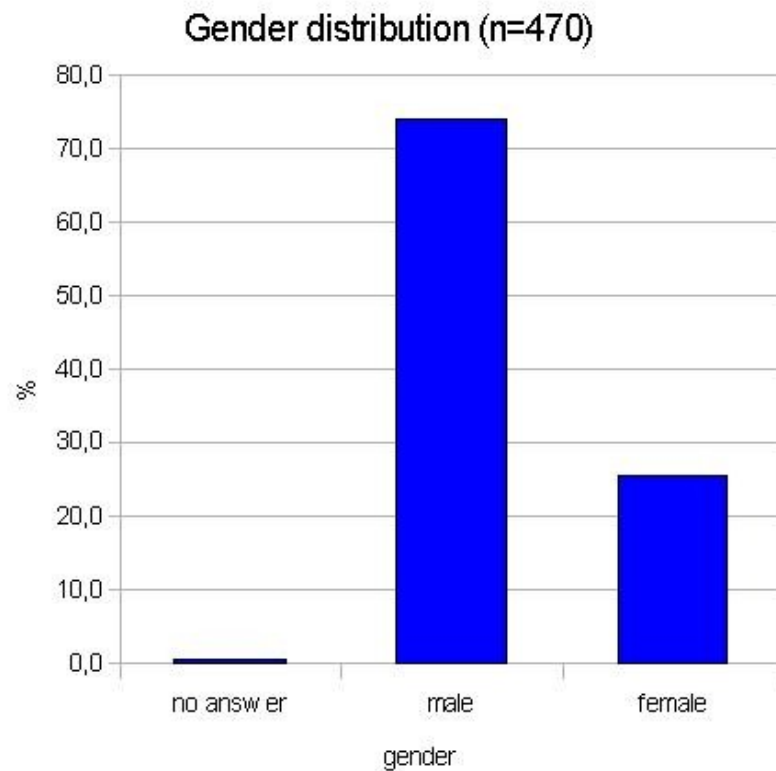
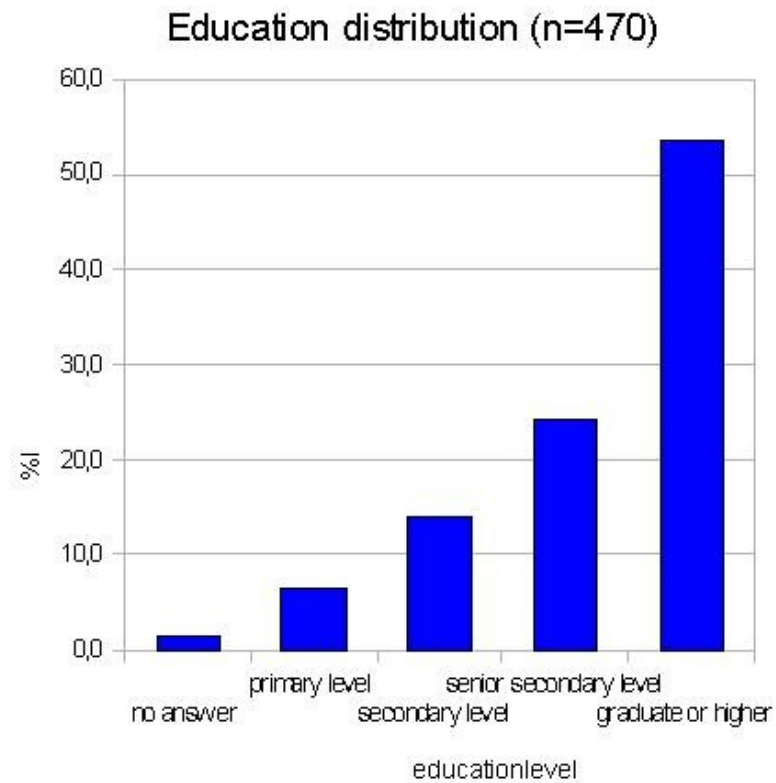
To begin with, the sample of 470 respondents is not evenly distributed in terms of the different parameters. The age groups of 20-29 and 30-39 are both highly overrepresented, while the group above 60 reflects the general age composition of Delhi very well. As the survey was carried out by students of this might have to do with personal preferences of the interviewers to ask respondents of their own age group. In terms of income, the sample can roughly be considered as normally distributed, taking into account the survey design of neglecting the poorest section of society. The distribution of the respondents in terms of education levels is extremely right-sided with the maximum of 53.6% in the highest education level of graduate or higher. This can be explained by the generally very high literacy rate of Delhi and by the composition of the survey area, which includes some of the wealthiest colonies of Delhi. The gender bias of 74% male respondents can be explained first by my instructions to ensure 50% male respondents, as I assumed that male persons in Delhi participate more in traffic than female persons, who still very frequently play the traditional role of the housewife. Besides, the experiences of the interviewers showed that when entering an Indian home it is highly probable that whenever both wife and husband are at home, the husband is more likely to handle issues with strangers so he is more likely to answer.

Age distribution (n=470)



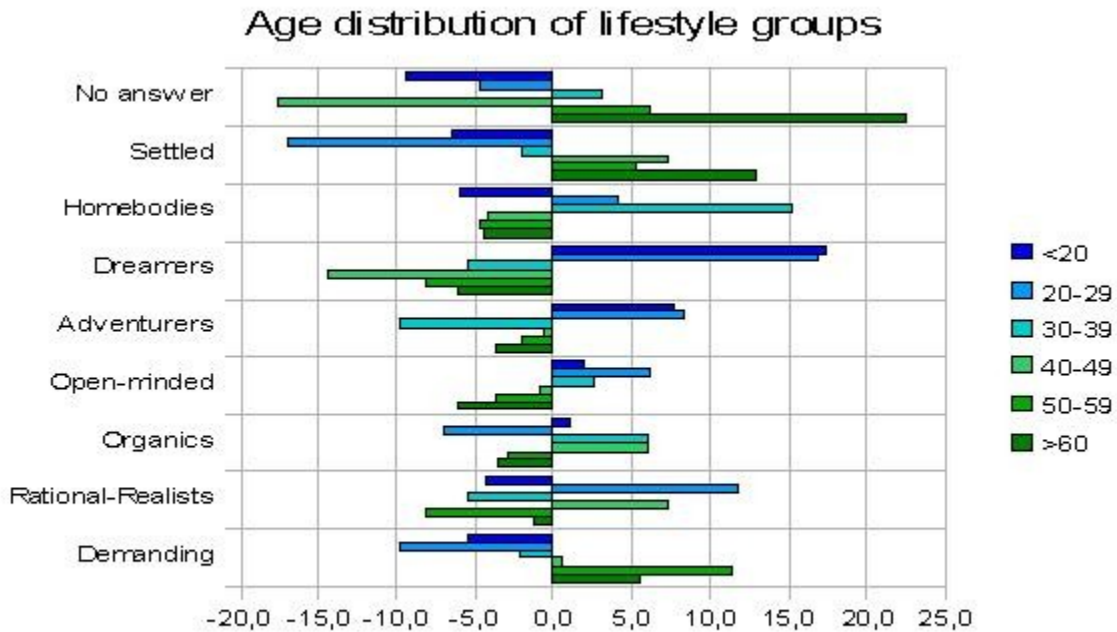
Income distribution (n=470)





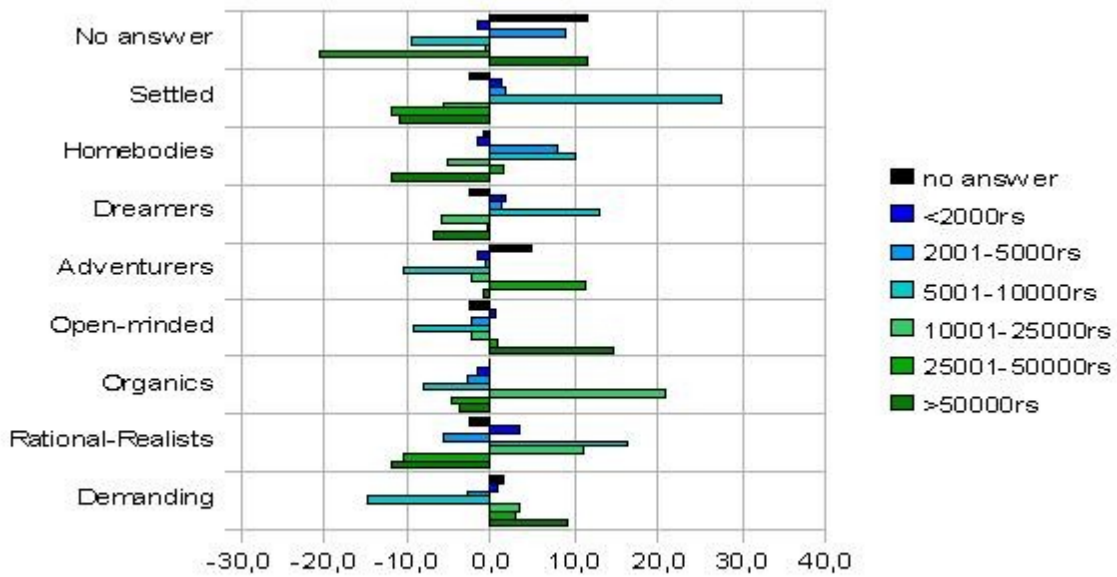
In the following step I take these distributions as an arithmetic mean to assess deviations for each lifestyle. As obvious from image 8, especially the Settled and the Demanding comprise of a significant amount of

respondents of older age, whereas Homebodies, Dreamers, Adventurers and Open-Minded are constituted predominantly by younger people. Organics seem to contain predominantly middle-aged people and Rational-Realists do not feature any clear trend in terms of age influence.



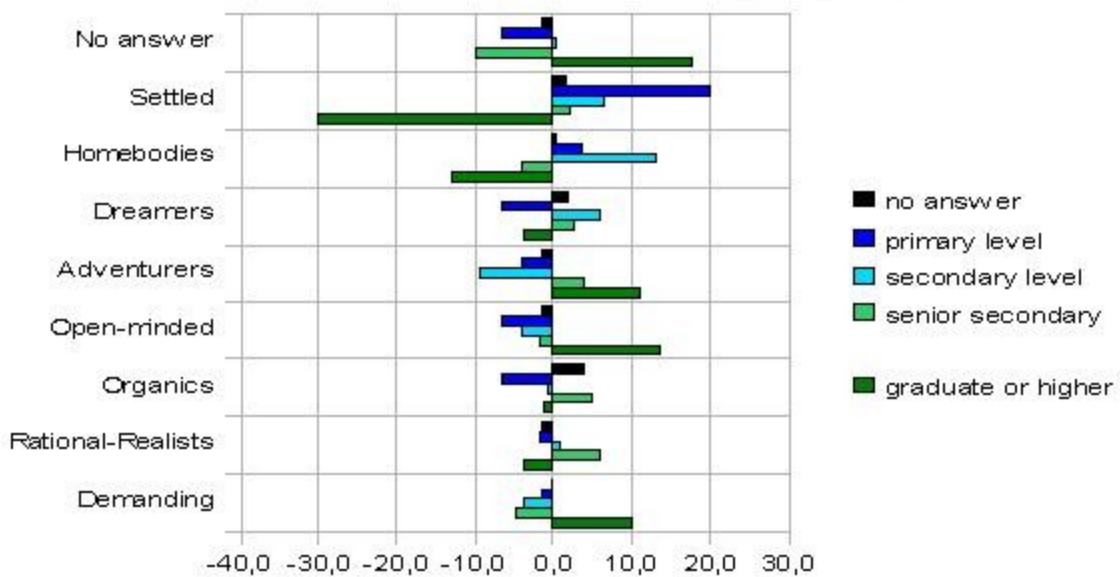
The deviation from average income distribution shows, that Settled, Homebodies and Dreamers tend to comprise of socio-economically weaker people. Organics and Rational-Realists are overrepresented by middle income groups, whereas Adventurers, Open-Minded and Demanding are lifestyles with a significantly higher share of people of higher income groups. Especially the Open-Minded are overrepresented significantly among the >50.000 INR income group.

Income distribution of lifestyle groups

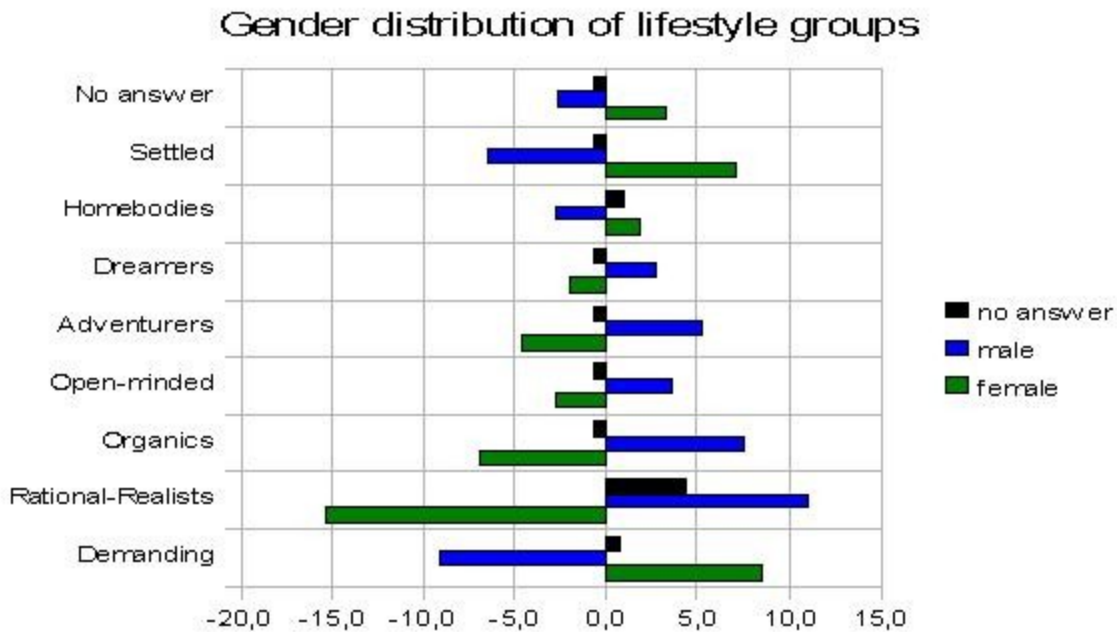


Concerning the relationship of lifestyles and education, lower education levels are overrepresented among the Settled and the Homebodies. Dreamers, Organics and Rational-Realists have a significant amount of people with secondary or senior secondary level as their highest grade and Adventurers, Open-Minded and Demanding are lifestyles which tendentiously comprise of higher educated people.

Education distribution of lifestyle groups



In reference to the gender distribution, the Settled, Homebodies and Demanding feature an over-proportional share of female respondents, with the gender bias of the Homebodies relatively low. All the other groups are dominated by men. The greatest disproportion between the genders are among the Rational-Realists in favour of male and among the Demanding in favour of female.



To conclude, table 1 gives an overview of a typical person of the respective lifestyle group as a result from my survey. My empirical findings reflect by and large the groups' characteristics as evident from other RCS©-surveys.

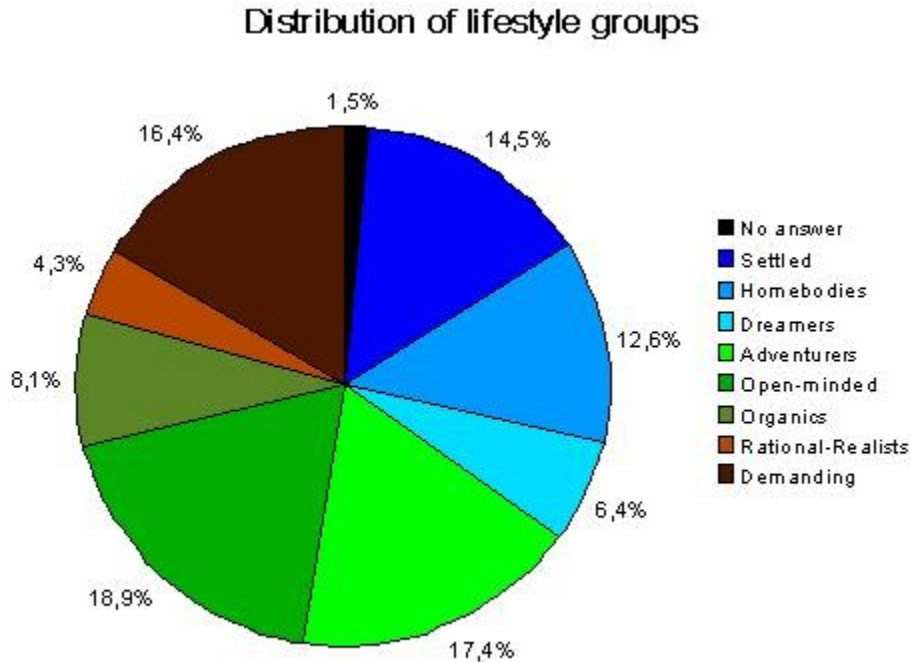
Table 1: Overview of lifestyle group characteristics

Lifestyle	Age	Income	Education level	Gender
Settled	Old	Low	Low	Female
Homebodies	Relatively young	Low	Relatively low	Both sexes
Dreamers	Young	Middle	Middle	Both sexes
Adventurers	Young	Relatively high	High	Male
Open-Minded	Relatively young	Very High	Very High	Both sexes
Organics	Middle aged	Middle	Middle	Rather Male
Rational-Realists	Middle aged	Lower Middle	Middle	Male
Demanding	Old	Very High	Very High	Female

Source: Own representation (2010)

In my sample of 470 respondents the eight lifestyle groups are distributed as shown in image 12. Apart from Adventurers being nearly three-times over represented and Demanding being double under represented, these figures reflect more or less the distribution of lifestyles within the Indian urban middle class based on the

experience of more than 60.000 respondents from surveys carried out by GfK.¹⁶ This has to do with my survey design, especially with the sample bias of young people and with the survey area including very wealthy colonies.



3.2 Correlation analysis of different parameters with multi-modal traffic behavior

In order to assess the explanatory content of different parameters for multi-modal traffic behavior I conducted a multivariate correlation analysis. My dependent variables are “multi-modal”, “use BRT bus”, “use BRT-cycle tracks”, “use cycling in general”, “use of or interest in public bicycle sharing (PBS)”. The parameters I correlated with these variables are age, income, highest education level, gender, vehicle ownership, average trip length and lifestyle.

First of all I have to explain how I computed the different variables and parameters. For “use of BRT-bus” and “use of BRT-cycle lanes” the respondents simply could chose between yes or no. “Use of cycling in general” I derived from the respondents' information provided from the question about their mode of transport for different activities. When a person ticked the bicycle as a mode of transport at least for one of the activities commuting, shopping or leisure, I considered him/her to be a cycle user. The answer does not provide me with the information about the frequency of use, though. For the variable “Use of or interest in public bicycle sharing” I combined the positive responds for the questions on whether they have used the system and whether they are interested to rent the bicycles in future. “Multi-modality” is the most complex variable to define because of the variety of possible answers. I computed this variable from the question on mode of transport for different activities. I defined multi-modal as the following:

- 1) A person with an own motorized vehicle available who (sometimes) uses a non-private mode (metro, bus, auto-rickshaw, cycle-rickshaw, rental bicycles, train) or his own personal bicycle for his urban

¹⁶ Information provided per Email by Dr. Matthias Hauck, director of lifestyle research, GfK

mobility.

- 2) A person without an own motorized vehicle available who uses at least two different non-private modes of transport.

In this definition, people who sometimes use their own car and sometimes their own motorbike, are not multi-modal because they rely only on private motorized vehicles. Furthermore, people who exclusively use the bus for all occasions are not multi-modal because they either do not have a choice or they deliberately do not use other modes.

Most of the correlation parameters are explicit. Age, income, highest education level and gender derive simply from the respective answers given. The methodology of obtaining the lifestyle parameter is explained in chapter 2.1. For vehicle ownership I constructed four different classes. I distinguished between people who do not have any private vehicle, people with maximum a bicycle, people who own a motorbike (and possibly a bicycle) but no car, and people who own a car (including other vehicles as well). Average trip length is based on subjective appraisals from the respondents and does not reflect the real average distance of their trips. It rather gives an idea about the general radius of action. I subdivided the sample into six classes of average trip lengths, from under 2.5 km to over 20 km. The following cross-tables give an overview over the different socio-economic parameters and the mobility variables. The first two columns express the distribution of the parameter values within my survey sample as an absolute and an relative value. Accordingly, the values for the five mobility variables are given in absolute and relative figures. By comparing the parameter value for a variable with the average value in the second but last row it is possible to say which lifestyles, income groups, age groups, etc. are over- or under-represented in each variable.

Table 2: Mobility by lifestyle

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No answer	7	1.5	2	28.6	3	42.9	1	14.3	0	0.0	1	20.0
Settled	68	14.5	34	50.0	48	70.6	11	16.2	4	5.9	5	7.9
Homebodies	59	12.6	26	44.1	31	52.5	5	8.5	7	11.9	9	17.0
Dreamers	30	6.4	15	50.0	21	70.0	7	23.3	5	16.7	10	34.5
Adventurers	82	17.4	34	41.5	31	37.8	11	13.6	10	12.2	29	37.2
Open-Minded	89	18.9	41	46.1	33	37.1	15	16.9	15	16.9	19	22.6
Organics	38	8.1	16	42.1	16	42.1	7	18.4	4	10.5	5	13.9
Rational-Realists	20	4.3	16	80.0	13	65.0	6	30.0	5	25.0	6	31.6
Demanding	77	16.4	31	40.3	28	36.4	9	11.7	6	7.8	23	30.7
Total/ Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation ¹⁷		NA		NA		NA		NA		NA		NA

Source: Own representation (2010)

To begin with, all lifestyle groups feature distinct characteristics in terms of mobility behavior. Following the conclusions from table 2, people belonging to the lifestyle group Settled are multi-modal above average. They are relying significantly on buses but refuse more or less to cycle. They also do not show a significant interest in renting cycles.

For Homebodies it is not possible to detect major significances. Nearly all figures are located near the average. The only significance can be drawn from their relative low interest in bicycle sharing. Their traditional values do not support such a radically new mobility concept.

Dreamers show a very high interest in the bicycle sharing system. It seems that the image of individuality and modernity provided by the project attracts them highly. The high figure of Dreamers using BRT-buses shows that due to their relative young age they are often dependent on public transport. This dependency also explains their interest in public bicycle sharing.

Adventurers feature a relatively low level of multi-modality. They rely predominantly on car and motorbike use as this seems to address their aspirations for demonstrating their material independence and coolness. Besides they show the highest interest in PBS so in order to attract this target group the system has to include a significant coolness and fun factor.

Open-Minded are less frequently using buses but are using the bicycle as a mode of transport more often. This coincides with their tendency to behave in a socially responsible way.

The data concerning mobility pattern of Organics provides some quite surprising results. Although Organics value sustainability very much they are using buses and bicycles below average. They are also not so much

¹⁷ Because the lifestyle parameter is nominally scaled, a calculation of correlation coefficients is not possible

interested in bicycle sharing facilities. This might have to do with the relatively low quality level of the domestic bicycles. Organics value high quality and convenience, aspects not yet being addressed by the Indian bicycle market.

Rational-Realists feature the highest share of multi-modal people within their lifestyle group. They use buses way above average, show the highest figure of cyclists and they are interested very much in the bicycle sharing project. This behavior resembles their commitment towards livability and their respect for nature.

Respondents who can be classified as Dreamers and Adventurers are the most receptive for using or being interested in the public bicycle sharing system. Keeping the characteristics of these lifestyle groups in mind this result is not surprising. Both these lifestyle groups value fun-orientation, hedonistic activities and innovation which this project seems to address. A second interesting result derives from the question whether people use the BRT bus. Dreamers and Settled are much more frequently going by bus than Demanding or Open-Minded. Hence people who value quality and status more than a good bargain are not attracted by the buses.

Table 3: Mobility by income

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No answer	12	2.6	7	58.3	5	41.7	2	16.7	1	8.3	3	30.0
<=2.000rs	8	1.7	3	37.5	7	87.5	3	37.5	1	12.5	2	25.0
2.001-5.000rs	26	5.5	11	42.3	18	69.2	10	38.5	9	34.6	4	16.0
5.001-10.000rs	112	23.8	67	59.8	85	75.9	30	26.8	25	22.3	24	22.9
10.001-25.000rs	137	29.1	66	48.2	72	52.6	21	15.3	11	8.0	33	26.8
25.001-50.000rs	96	20.4	29	30.2	25	26.0	4	4.2	5	5.2	25	27.5
>50.000rs	79	16.8	32	40.5	12	15.2	2	2.5	4	5.1	16	20.3
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation				-0.17		-0.96		-0.97		-0.64		0.18

Source: Own representation (2010)

Assessing the influence of income on mobility patterns it is very significant that there is a high negative correlation between income and “using the BRT bus” as well as “using cycling”. Still as there is no significant correlation between income and “multi-modality” people of higher income groups are using other modes of transport than the buses or their private vehicles, predominantly auto-rickshaws and metro. Besides, there is a relatively even distributed interest in PBS so this project seems to be attractive for all kinds of income groups.

Table 4: Mobility by education

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No answer	7	1.5	3	42.9	5	71.4	0	0.0	1	14.3	1	16.7
Primary level	31	6.6	20	64.5	27	87.1	10	32.3	4	12.9	7	24.1
Secondary level	66	14.0	40	60.6	52	78.8	20	30.3	9	13.6	16	26.7
Senior Sec. level	114	24.3	56	49.1	66	57.9	23	20.2	27	23.7	30	29.1
Graduate or higher	252	53.6	96	38.1	74	29.4	19	7.6	15	6.0	53	21.8
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation				-0.98		-0.97		-0.96		-0.19		-0.18

Source: Own representation (2010)

Mobility behavior seems to be highly determined by the education level. One could argue that awareness for the personal responsibility in terms of the mobility behavior is not at all addressed during education.

Table 5: Mobility by gender

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No answer	3	0.6	2	66.7	1	33.3	0	0.0	0	0.0	1	50.0
Male	348	74.0	146	42.0	161	46.3	65	18.7	52	14.9	79	24.2
Female	119	25.3	67	56.3	62	52.1	7	5.9	4	3.4	27	23.9
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation ¹⁸				NA		NA		NA		NA		NA

Source: Own representation (2010)

Female respondents tend to be more multi-modal than their male counterparts. On the other hand, cycling is dominated by men. Nevertheless both gender express interest in the PBS.

¹⁸ Calculation of correlation coefficient not possible because of only 2 values

Table 6: Mobility by age

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
<20	44	9.4	22	50.0	32	72.7	14	31.8	11	25.0	18	45.0
20-29	156	33.2	75	48.1	85	54.5	34	21.9	27	17.3	41	27.9
30-39	120	25.5	50	41.7	46	38.3	14	11.7	14	11.7	23	20.4
40-49	83	17.7	40	48.2	33	39.8	5	6.0	2	2.4	16	20.3
50-59	38	8.1	18	47.4	15	39.5	4	10.5	1	2.6	7	20.6
>60	29	6.2	10	34.5	13	44.8	1	3.4	1	3.4	2	7.1
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation				-0.67		-0.73		-0.91		-0.92		-0.91

Source: Own representation (2010)

Age is the parameter with the highest influence on mobility in my survey, a quite expectable result. All variables feature highly negative correlations.

Table 7: Mobility by vehicle ownership

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No own vehicle	47	10.0	14	29.8	44	93.6	3	6.4	0	0.0	6	15.8
Maximum bicycle	24	5.1	16	66.7	19	79.2	17	70.8	19	79.2	6	25.0
Motorbike (incl. motorbike and bicycle)	164	34.9	103	62.8	104	63.4	41	25.0	26	15.9	41	27.5
Car (including car and other vehicles)	235	50.0	82	34.9	57	24.3	11	4.7	11	4.7	54	23.5
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation				0.08		-0.97		-0.2		-0.17		0.65

Source: Own representation (2010)

A very interesting result depicts the strong positive correlation between vehicle ownership and use of/ interest in PBS. The project seems to be attractive for people having their own motorized vehicles at their disposal.

Table 8: Mobility by average trip length

	Count	Share (%)	Multi-modal	Share (%)	Use BRT bus	Share (%)	Use BRT cycle lane	Share (%)	Use cycling	Share (%)	Use/ interest in PBS	Share (%)
No answer	3	0.6	2	66.7	1	33.3	1	33.3	0	0.0	1	33.3
<2,5km	61	13.0	26	42.6	38	62.3	13	21.3	8	13.1	10	16.9
2,5-5km	117	24.9	48	41.0	54	46.2	23	19.7	25	21.4	23	20.9
5-10km	152	32.3	71	46.7	72	47.4	19	12.5	11	7.2	39	27.1
10-15km	85	18.1	44	51.8	40	47.1	13	15.5	10	11.8	20	27.0
15-20km	36	7.7	18	50.0	15	41.7	2	5.6	2	5.6	11	33.3
>20km	16	3.4	6	37.5	4	25.0	1	6.3	0	0.0	2	15.4
Total/Average	470	100	215	45.7	224	47.7	72	15.4	56	11.9	107	24.3
Correlation				0.06		-0.89		-0.9		-0.79		0.23

Source: Own representation (2010)

Table 8 shows that people with bigger radius of action are less multi-modal and use buses and bicycle less frequently. One could argue vice versa that due to use of individual motorized vehicles the radius of action increases.

By computing correlation coefficients for these parameters I am able to compare the explanatory content of each parameter for the mobility pattern of the residents in my survey area. Because the lifestyle variable is nominally scaled it cannot be ordered meaningfully. Hence no correlation analysis is possible. Although it is not possible to order all eight values, I am able to order them in a matrix according to the structural map of value orientations from the Roper Consumer Styles © model. There is an order of lifestyles between the requirement to have and to be, as well as between the requirement of peace and security and to live passions. The numbers in parenthesis reflect the ordinal order on the horizontal and vertical axis.

Table 9: Ordinal structure of lifestyle values

	Requirement to have			
Requirement to live passions	Dreamers (1)	Homebodies (4)	Settled (7)	Requirement of peace and security
	Adventurers (2)	Rational-Realists (5)	- (8)	
	Open-Minded (3)	Organics (6)	Demanding (9)	
	Requirement to be			

Source: Own representation (2010)

In order to obtain correlation coefficients I enter the share of each lifestyle value for the different dependent variables (multi-modality, use cycling, etc.) in the respective cell and correlate them with the ordinal order within this structural matrix. I calculate correlation coefficients horizontally, vertically and diagonally and take the mean as the final coefficient. As an example, see table 10.

Table 10: Lifestyle correlation for multi-modality

	0,21					
0.28	0.23	0.46	0.05	NA	0.11	-0,28
	0.00	50.0	44.1	50.0	0.00	
	NA	37.8	65.0		NA	
	0.98	37.1	42.1	36.4	-0.98	
	-0.11	-0.46	-0.05	NA	-0.23	
	-0,21					

Source: Own representation (2010)

In this way I am able to give correlation coefficients for multi-modality and passionate/adventurous/hedonistic lifestyles, or for materialistic/price-oriented lifestyles, for example. The following table gives an overview on the correlation coefficients for each parameter (apart from gender where no correlation is possible) and each dependent variable.

Table 11: Correlation overview

Explanation	Multi-modality	Use BRT bus	Use cycle lane	Use cycling in general	Use of interest in PBS
Requirement to have	0,21	0,80	0,19	0,00	0,32
Requirement to live passions	0,28	0,02	0,47	0,77	0,52
Income	-0,17	-0,96	-0,97	-0,64	0,18
Education	-0,98	-0,97	-0,96	-0,19	-0,18
Age	-0,67	-0,73	-0,91	-0,92	-0,91
Vehicle ownership	0,08	-0,97	-0,21	-0,17	0,65
Average trip length	0,06	-0,89	-0,92	-0,79	0,23

Source: Own representation (2010)

The figures show that age has the highest influence on personal mobility choices. The respective numbers show high negative correlations for all dependent variables. That means the older a person, the less likely he is multi-modal, uses the BRT-bus, cycles and shows interest in renting bicycles. For all other parameters the picture is a bit more differentiated. Apart from age the education level seems to have a high negative influence on multi-modality, bus use and cycle lane use but not on cycling in general and not on interest in public bicycle sharing. Income, vehicle ownership and average trip length feature also high negative correlations with multi-modality. Using the cycle lane and using cycling in general can be explained by average trip length and income as well. In contrast, vehicle ownership does not necessarily determine whether people cycle or not.

Regarding my main hypothesis whether urban mobility, especially cycling, is determined not only by income but also by lifestyle orientations, I obtained some very interesting results. First, considering the results for the general use of cycling there is quite expectedly a negative correlation between age and cycling. Besides, average trip length seems to have an impact on cycling. The bigger the respondent's radius of action within

Delhi, the lesser they use a bicycle or vice versa: The lesser people cycle the higher the radius of action. The direction of causes is not detectable. Income also shows a negative correlation with cycling, but it is only 0.64, thus not very high. A stronger correlation can be found between cycling and lifestyles who appreciate fun, action, adventure and passion (0.77). The other axis of the lifestyle matrix does not have an influence at all on cycling.

Second, the correlation coefficients with “use of or interest in public bicycle sharing” show a quite colorful picture. Only three out of eight parameters show a significant correlation of more than 0.5, out of which age again shows a highly negative correlation (-0.91) whereas vehicle ownership (0.65) and requirement to live passions (0.52) feature a positive correlation. These figures indicate that this project addresses more the people who want to substitute their own (motorized) vehicles instead of those without any own vehicle. It also targets specific lifestyle groups, who can be embraced by their common focus on fun, action and adventure and who are relatively young. Income, education level, materialistic or post-materialistic value orientations and average trip length do not determine the respondents interest in this project.

One conclusion which reflects the quality of the current bus service can be drawn from the strong positive correlation (0.80) of materialistic lifestyles and using the BRT bus. In a reversed statement one can argue that, because post-materialistically oriented people who appreciate quality are by and large not using the BRT buses, the service and quality provided is not attractive for them.

4. Conclusion

The results of my survey clearly show the importance to differentiate the society not only in terms of income, age, gender, etc. but also in terms of lifestyle. For transportation planning this has some quite practical ramifications. Bearing in mind that a certain product will never be accepted and used by the total population but is always addressing specific target groups, I could proof that cycling is subject to personal attitudes and values rather than to income. I gave statistical evidence that cycling is not necessarily decreasing with rising income but has the potential to remain an option for a multi-modal mobility among the middle class as well. For the “product” bicycle sharing as a form of a new mobility my analysis lets assume the following results: The project has a high potential among people who are

- young above average
- eager to substitute their own personal vehicles by rental bicycles
- fun-oriented, hedonistic
- searching for strong brands and products with positive, innovative images
- familiar and interested with modern technologies like Internet, mobile communication, navigation systems, etc.

For Delhi's PlanetGreenBike project especially and bicycle sharing systems in general this demands for a strong focus on fulfilling the pretense of the potential clients. They want to ride bicycles which are cool in design and which have a certain innovative technology. They are demanding an easy access based on the use

of technology applications and they want to be perceived as trend setters. These aspects have to be taken into account during implementation and communication/marketing of bicycle sharing projects. The general lesson to be learned from this exercise is that a value driven lifestyle approach has to be incorporated into planning strategies for urban transportation. Especially in terms of (social) marketing for a new mobility this is essential to receive the expected acceptance for these projects.

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