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Edited by Andrea Molle



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## **Introduction**

Welcome to the first edition of the IAFOR Journal for the Social Sciences. Our journal encourages critical application of ideas and theories about society and aim to constitute an open forum for new theoretical developments in this broad field of the Social Sciences by providing provides a space for international dialogue and critical approaches.

Steaming from the IAFOR series of Asian conference for the Social Sciences, the Journal constitutes a venue for academic research in the complex and multifaceted field of Social Sciences. The Journal takes into consideration social, cultural, political, and economic phenomena through their historical developments and contemporary evolution. It explores the interplay between politics, economics, and society; the dynamics of globalization; and International Relations.

The IAFOR Journal for the Social Sciences is committed to an approach based on scientific studies, and is open to contributions coming from different disciplines, such as anthropology, sociology, political science, media and area studies.

In our first paper the authors discuss the attitudes toward immigrants of different ethnic origins in the context of the United States of America. Their robust analysis shows how the ambivalent attitudes toward immigrants can be explained by the reference to the concepts of egalitarianism, which is defined by social equality and social justice, and the Protestant Work Ethic (PWE), which is defined by self-discipline and individual achievement. In the second paper we move to Africa where the authors examine the very interesting case of disease control in Nigeria with particular attention to measles and polio. The authors argue that Nigeria is facing the dramatic health challenges posed by such diseases not only because of social, cultural, and political issue but largely because of the underutilization of epistemic resources as well as a consequence of the complex dependence on foreign sources for vaccine production and supply. The third paper brings us to China where the authors offer us a vivid description of the particular characteristic of road traffic and driving behaviors of both cars and two-wheelers. While arguing the need to go beyond the restrictive definition of risky driving behaviors in terms of errors, violations, or self/hetero aggressive intent, the authors aim to provide a more data driven definition. China is still under the lenses in our last paper. The author starts by observing the fact that the rate of homeownership in Chinese cities increased in the last years. Nevertheless, it has become much more difficult to



become a homeowner in China for the sharp hike in housing prices in the past few years has made homeownership a great challenge to lower income young urban households.

I would like to thank the contributors, reviewers and editorial board for their work on this issue. We look forward to seeing you at the 2014 IAFOR Asian Conference for the Social Sciences.

Andrea Molle

Editor

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### **About the Editor**

Dr Andrea Molle is post-doctoral fellow in Sociology at Chapman University, Orange (CA). He holds a Ph.D. in Sociology with a focus in Anthropology and Research Methods from the University of Milan and B.Sc/M.Sc. in Political Sciences from the University of Genoa. Prior to coming to Chapman, he held a Post-doc at Baylor University (Waco, TX) and was Associate Researcher of the Sociology of Prayer at the University of Padova (Italy). From November 2006 to November 2008, he conducted anthropological research on new religions in Japan working at the Nanzan Institute for Religion and Culture (Nagoya) under the JSPS programme. He is also Associate Researcher with the Italian School for East Asian Studies in Kyoto. Current projects at Chapman focus on computational social science, on religious deviance, on Japanese new religions, and on non-Christian spiritualities. He has published a book on new religions (in Italian) and several articles in journals in the fields of sociology and anthropology.

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Attitudes Toward Immigrants: Test of Protestant Work Ethic,  
Egalitarianism, Social Contact, and Ethnic Origin

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## **Abstract**

Americans' attitudes toward immigrants can be described as ambivalent. While some attitudes toward immigrants have been antagonistic, Americans have also espoused beliefs that the United States is a nation of immigrants and that cultural diversity is one of America's foremost strengths. These ambivalent attitudes toward immigrants might be explained by egalitarianism, which is characterized by social equality and social justice, and the Protestant Work Ethic (PWE), which is characterized by self-discipline and individual achievement. Using data collected from a major metropolitan area in the Midwest (n=382), this study explored two questions: 1) are there any differences in attitudes toward immigrants of differing ethnic origins? and 2) what are the roles of egalitarianism, PWE, personal, and impersonal contact in people's attitude toward immigrants? The results of repeated measures ANOVA indicated a significant effect of ethnic origin, with European immigrants perceived most positively and Middle Eastern immigrants least positively. The results of regression analyses also revealed that egalitarianism was associated with positive general attitudes toward immigrants and PWE with negative attitudes. Further, close contact was associated with positive attitudes toward immigrants, whereas impersonal contact did not impact general attitudes toward immigrants. Implications for intercultural education are discussed.

*Keywords:* attitudes toward immigrants, contact theory, Protestant

Work Ethic, egalitarianism, immigrants' race



## **Attitudes Toward Immigrants: Test of Protestant Work Ethic, Egalitarianism, Social Contact, and Ethnic Origin**

According to the 2010 Yearbook of Immigration Statistics (Office of Immigration Statistics, 2011), between 2001 and 2010, close to a million individuals on average have obtained legal permanent residency status per year in the United States. While the numbers of immigrants have increased substantially over the years, so has the country of origin of these individuals (Office of Immigration Statistics, 2011), resulting in diverse cultures, customs, and ideologies. Although the U.S. is a nation of immigrants, out-group negativity and in-group favoritism have led to undesirable outcomes for some racial and ethnic minority groups. Such outcomes include the Chinese Immigrant Exclusion Law, the harassment of Irish and Italian immigrants at the turn of last century, and the internment of Japanese immigrants during World War II. More recently, following the events surrounding 9/11 and an increased negative sentiment toward undocumented workers, there has been a rise in discriminatory sentiments toward Middle Eastern and Latino immigrants, respectively (Kivisto and Faist, 2010; Leonard, 2003; Matsuo, 2005). Furthermore, there is a consistent pattern of findings in the literature indicating that a large proportion of Americans hold prejudicial views toward immigrants. With these negative views toward immigration, the possible consequence of increased competition for resources, a realistic threat, as well as increased threats of one's worldview emerge (Stephan et al., 1999).

Although discriminatory actions toward immigrants are well-recognized, there is a convincing body of literature that indicates that attitudes toward these individuals, as well as racial and ethnic out-group members more generally, may be best characterized as

ambivalent (Biernat, Vescio, Theno, & Crandall, 1996; Crandall & Eshleman, 2003; Katz & Haas, 1988; Katz, Wackenhut, & Hass, 1986; Maio, Bell, & Esses, 1996). Ambivalent, in this context, indicates that both positive and negative attitudes toward immigrants are simultaneously present. Positive elements may originate from feelings of sympathy based on out-group's social disadvantages (e.g., low economic status; difficulties with language; presence of stereotypes), whereas the negative elements may originate from feelings of antipathy, based on the symbolic or real threats that out-groups pose (e.g., competition for jobs; differences in religious beliefs).

Prior theorization suggests that these elements have developed from the presence of two conflicting values, egalitarianism and the Protestant Work Ethic (PWE), which are both frequently endorsed in American society (Biernat et al, 1996; Katz & Haas, 1988). Egalitarianism is characterized by valuing social equality in a manner that is consistent with concern for social justice and help for others in need (Katz & Haas, 1988; Katz, Wackenhut, & Hass, 1986). PWE, on the other hand, is a core American value that was first identified in 1904 by Max Weber in his seminal work *The Protestant Ethic and the Spirit of Capitalism*. PWE is an individualistic ideal, characterized by hard work, self-discipline, and individual achievement (Katz & Haas, 1988; Katz, Wackenhut, & Hass, 1986). Regardless of religious affiliation, people who tend to endorse PWE are generally unsympathetic toward out-groups, believing that they should be able to “pull themselves up by their bootstraps” and overcome social inequality without the need for social welfare programs. Thus, whereas egalitarianism is viewed as more collectivistic, PWE is viewed as more individualistic, and in this sense, may be viewed as potentially conflicting. This conflict between core values is often described by national figures, such as President Obama who said in 2008, “That's the promise of

America, the idea that we are responsible for ourselves, but that we also rise or fall as one nation, the fundamental belief that I am my brother's keeper, I am my sister's keeper.”

As one would expect, egalitarianism has been shown to be negatively associated with racial prejudice (Biernat et al, 1996; Swim, Aikin, Hall, & Hunter, 1995) and sexism (Swim, Aikin, Hall, & Hunter, 1995). Conversely, endorsing PWE is positively associated with modern and old-fashioned forms of racism, as well as sexism within men (Swim et al, 1995), and is especially predictive of prejudice toward those out-groups who are stereotypically perceived as behaving or holding values incompatible with PWE (Biernat et al, 1996). For this reason, it is possible that immigrants are perceived differently, and this may be due to how some ethnic origins are viewed generally as holding values consistent with PWE whereas others may be viewed as violating PWE.

While personal values may play a role in how one perceives immigrants, social relationships may also impact these perceptions. This notion is grounded in the idea that negative attitudes stem from unfamiliarity with out-group members. That is, when individuals do not have personal contact with members of other cultural groups, the only knowledge they may have of those groups is likely to be comprised of social stereotypes. Consequently, when individuals get the opportunity to form close relationships across group boundaries, they may learn that prevalent stereotypes are untrue or exaggerated, and thus form many more favorable views of those groups. This idea is the basis for the contact hypothesis, which states that increased social interactions lead to increased positive attitudes toward out-group members (Allport, 1954; Brewer & Gaertner, 2001). Overall, the contact hypothesis has received considerable empirical support (Hewstone & Brown, 1986; Pettigrew, 1997; 1998; Pettigrew & Tropp, 2006). For example, Pettigrew and Tropp (2006) conducted a meta-

analysis of 515 empirical studies on the contact hypothesis and found that overall higher levels of contact are associated with lower levels of prejudice (mean  $r = -.215$ ).

However, all contact may not be considered equal. For instance, Allport (1954) identified four key conditions for contact to have optimal effects on reducing prejudice: equal group status, common goals, intergroup cooperation, and support of authorities. Similarly, Pettigrew (1998) argued that intergroup friendships are key forms of contact that should result in the reduction of prejudice. Conversely, when individuals have only impersonal contact, or passive and superficial relationships, this may not yield similar results and in fact may lead to more negative attitudes toward out-group members. This may occur because interactions may be challenging. Individuals may speak different languages, and thus make these interactions difficult (Crandall & Eshleman, 2003; Hewstone & Brown, 1986). Thus, while we predict that personal forms of intergroup contact should be negatively correlated with prejudicial attitudes of immigrants, impersonal contact may be positively correlated.

In sum, the goals of this paper are to explore the relationships between egalitarian and PWE beliefs as well as attitudes toward immigrants of differing ethnic origins. Furthermore, the roles of personal and impersonal social contact are examined. Major questions that we address in this study are: 1) are there any differences in attitudes toward immigrants of differing ethnic origins? and 2) what are the roles of egalitarianism, PWE, personal, and impersonal contact in people's attitudes toward immigrants?

## **Method**

### **Sampling and Sample**

The setting for this study was St. Louis, Missouri. The number of immigrants living in St. Louis has spiked in the last two decade after St. Louis was designated as a preferred community for refugees of the genocide in Bosnia-Herzegovina. In addition, immigrants from Southeast Asia, the Middle East, and Africa have continued to migrate to St. Louis in large numbers (International Institute of St. Louis, 2005). It is estimated that the number of immigrants living in the city of St. Louis, including people from Eastern Europe, Middle East, Asia, Africa, and their American-born children is close to 100,000. This is about one-third of the population of the city, making the area one of the most ethnically diverse cities in the Midwest.

The sampling frame for the current study was limited to individuals (age  $\geq 18$  years old) residing in St. Louis, Missouri. St. Louis County was divided into four regions: north, central, south, and suburbs to ensure adequate racial compositions and median family incomes within the sample. Four zip codes were then randomly selected from within each of these four regions. Selected zip codes were then given to Americalist, a company which provided lists of names, addresses, and telephone numbers. Within each of the sixteen zip codes, 125 addresses were randomly selected to receive a survey packet by mail (for a total of 2,000). A total of 382 people responded the survey without a follow-up letter (174 male, 202 female, 6 missing). While the Total Design Method (TDM) developed by Dillman in the mid 1970's yielded high response rates a few decades ago, this method has some shortcomings in the current age (Dillman, 2000). In order to maximize the available resource, we chose not to use TDM. The sample comprised of 288 Whites, 42 Blacks, 40 participants from other racial



minority groups, and 12 missing information in racial background. The mean age of the sample was 50.10 ( $SD = 13.82$ ) and with 94% ( $n=360$ ) born in the United States.

### Measures

**Attitudes toward specific ethnic groups.** Participants reported their attitudes toward Asian, African, Middle Eastern, Bosnian, and European immigrants by completing semantic differential items. Participants were asked to make bipolar ratings for each ethnic group on 7-point scales for the following dimensions: *cold-warm*, *negative-positive*, *unfriendly-friendly*, *disrespectful-respectful*, *uncomfortable-comfortable*, *unwelcoming-welcoming* (modified from Voci & Hewstone, 2003). The six items were summed to form overall attitudes toward specific ethnic group scores, where higher scores indicate more favorable attitudes.

**Social contact.** Participants completed an 11-item social contact scale based on a revision of a previous scale devised by the first author (Matsuo, 1992). This scale was intended to measure personal (e.g., “How many of your close friends are immigrants?”) and impersonal contact (e.g., “How many immigrants do you encounter at work or school?”). Cronbach’s alphas for the present sample were 0.863 and 0.778, respectively.

**General attitudes toward immigrants.** Participants were asked to report their attitudes toward immigrants in general by completing a modified version of the 10-item scale used by Starr and Roberts (1982). The original scale was modified to measure attitudes toward immigrants living in St. Louis. Examples of items include “St. Louis has too many immigrants” and “It would be better if immigrants settle in another city or country.” Responses to each item were made on a 5-point scale with endpoints ranging from 1

(*Strongly Disagree*) to 5 (*Strongly Agree*). Items were summed to form a General Attitudes toward Immigrants scale. Cronbach's alpha for the present sample was 0.890.

**Humanitarianism / Protestant Work Ethic scale.** This 21-item scale was developed by Katz & Haas (1988) and was designed to measure humanitarian/egalitarian beliefs and beliefs that correspond to the Protestant Work Ethic. Responses to each item were made on a 6-point scale, ranging from -3 (*Strongly Disagree*) to 3 (*Strongly Agree*). Items were then summed to form an Egalitarian Scale and a Protestant Work Ethic scale (see Katz & Haas, 1988). Cronbach's alphas for the present sample were 0.757 and 0.707, respectively.

## Results

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See Table 1  
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We first tested the assumption that perceptions toward refugees varied by ethnic origin of immigrants. Repeated measures ANOVAs were used to compare attitudes toward each of the ethnic groups on each bipolar dimension. Since the assumption of sphericity was violated for all repeated measures models, F-statistics were evaluated using Greenhouse-Geisser corrections. Pairwise comparisons were made using Bonferroni corrections. Analyses were performed on samples with complete data available, thus, sample sizes varied due to missing data. Mean ratings with associated standard deviations, along with the ANOVA results, are reported in Table 1. All repeated measures ANOVAs were significant and pairwise comparisons indicated that Middle Eastern immigrants were rated more negatively than the other groups on all six dimensions. Furthermore, Asians were rated as being more respectful

than the other groups and higher on the positive dimension compared with Africans and Bosnians.

We next conducted a series of regression analyses to test the effects of several demographic variables, American values (egalitarianism vs. PWE), and social contact on attitudes toward refugees. We tested these variables first on general attitudes toward immigrants, and then separately on each different ethnic group. The results are shown in Table 2.

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See Table 2  
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In the model of general attitudes, race and gender had a positive significant impact on attitude ( $B = 4.173, p < 0.001$  and  $B = 2.698, p < 0.001$  respectively), meaning that Whites and males were more likely to show favorable general attitudes toward immigrants than non-Whites or females. As hypothesized, egalitarianism had a significant positive impact on both the general attitudes ( $B = 0.586, p < 0.001$ ) and on attitudes toward each ethnic group ( $B = 0.633, p < 0.001$  for Asians,  $B = 0.737, p < 0.001$  for Africans,  $B = 0.741, p < 0.001$  for Bosnians,  $B = 0.878, p < 0.001$  for Middle Easterners, and  $B = 0.368, p < 0.001$  for European, and  $B = 0.592, p < 0.001$  for Latino immigrants). In other words, the stronger egalitarianism beliefs a person had, the more positive attitudes he/she tends to hold toward immigrants. Further, PWE had a significant negative impact on general attitudes ( $B = -0.231, p < 0.001$ ) and on attitudes toward Africans ( $B = -0.229, p < 0.05$ ). In general, a greater adherence to PWE was associated with more negative attitudes toward Africans and immigrants. However, PWE was positively associated with attitudes toward European immigrants ( $B = 0.222, p < 0.01$ ). Finally, while personal contact had a significant positive impact on general attitudes ( $B = 0.241, p < 0.001$ ), impersonal contact did not. Regarding specific ethnic groups, there was evidence that

personal contact had a positive association with perceptions toward Middle Eastern ( $B=0.325$ ,  $p<0.05$ ) and Latino immigrants ( $B=0.235$ ,  $p<0.05$ ). Impersonal contact was significantly positively associated with attitudes only toward Africans ( $B=0.319$ ,  $p<.01$ ).

The results indicated that general attitudes toward immigrants are, as hypothesized, dependent upon egalitarian beliefs, such that increases in egalitarianism are associated with more positive attitudes, PWE, such that greater adherence to the PWE is associated with more negative attitudes, and primary social contact, such that increased personal contact is associated with more positive attitudes. When considering distinct ethnic origins of immigrants, similarities across groups were found for egalitarian beliefs, but with differences noted for PWE and primary social contact.

## **Discussion**

This study provides initial evidence that people in St. Louis hold ambivalent attitudes toward immigrants and that these attitudes may be based upon the maintenance of dual conflicting values of egalitarianism and PWE. Egalitarianism had a positive association with attitudes for each group, suggesting that this factor may be associated with broad attitudes toward immigrants, and possibly more generally toward other persons. This finding is consistent with work by Biernat et al. (1996), who suggested that egalitarianism is associated with lower levels of all forms of prejudice.

PWE, on the other hand, while negatively associated with general attitudes toward immigrants, did not show a consistent pattern across ethnic groups. For instance, PWE was significantly associated with attitudes toward Africans and Europeans, but not for the remaining groups. Furthermore, the significant relationships between PWE were not the same, suggesting that groups may be evaluated as adhering to different standards related to

PWE. The negative association with Africans may indicate that these individuals may be viewed as more strongly incompatible with PWE values, whereas Europeans may be viewed as more strongly compatible. These findings are not surprising given that the majority of the sample was White, i.e., European decent, and may reflect simply in-group favoritism and out-group bias. However, this explanation does not hold when the lack of significant association between PWE and attitudes toward Asians, Middle Eastern, Latino, and Bosnian immigrants is considered. While there is a large concentration of Bosnians in St. Louis, they are considered Caucasian and therefore their racial membership may negate some out-group biases. On the other hand, the lack of association between PWE and attitudes toward Asian, Middle Eastern, and Latino immigrants may reflect the relatively small numbers of these individuals in the community. Therefore, the compatibility of PWE with these groups may have been indeterminable by the respondents due to low degree of exposure to these groups.

The present study also shows that personal contact with out-group members plays an important role in determining attitudes toward immigrants in general, but in particular for Asian, Middle Eastern, and Latino groups. These are groups that have relatively smaller representation as ethnic and racial groups compared with Bosnian and Africans (and African Americans). This pattern of results, along with the ethnic group specific results with PWE, suggests that it is possible that when PWE is indeterminable, that degree of personal contact would impact attitudes toward immigrants. With African immigrants, however, it should be noted that impersonal contact, but not personal contact, was an important factor in positive attitudes. This finding may reflect the larger, complex black-white racial relationships in the St. Louis region and warrants further investigation.



Taken together, the findings from this study suggest that attitudes toward immigrants are related to the delicate interplay between egalitarianism, PWE, personal contact, and social context that varies by ethnic group. This finding provides a preliminary explanation for why prejudice toward some ethnic groups has diminished substantially over the last fifty years, while prejudice toward other groups remains unchanged. For example, although attitudes toward Asian and European immigrants have become more positive over time, attitudes toward other ethnic groups have become more negative (e.g., Middle Eastern immigrants). Further research that takes into account historical and immediate and global context variables is needed to explore this assertion more explicitly.

There are several limitations in this study worth noting. The rapid pace by which individuals are exposed to one another is changing the way we interact. The nature of impersonal interactions, for instance, now may be affected by increased participation in the global economy, which often involves telephone and tele-video interactions and email correspondence. Furthermore, there is increased coverage of global current events through the media. Thus information is becoming increasingly accessible on-demand through means, such as the internet, and thus increasing individuals' exposure to the global community. The extent to which these impersonal interactions and increased exposure may impact attitudes is not known and is worth considering in future research. Additionally, although the sampling method was applied in earnest to reflect the St. Louis population, the final composition of the sample included mostly Whites. While it was noted previously that St. Louis is among the most diverse cities in the Midwest region, our sample did not reflect this and therefore the generalizability of our results is limited. Furthermore, while the numbers of individuals who responded was reasonable considering the absence of reminders to participants and for the analyses at hand, the response rate was less than ideal. Future research that includes oversampling underrepresented populations would prove fruitful.

The results of this study also have practical implications. One implication is that clearly a one-size-fits-all approach to reducing negative attitudes toward different ethnic groups may not be the most productive. Instead, recognition of how the value systems of the audience (e.g., PWE) may affect the perceptions of specific out-group members would help inform the best approaches for reducing negative attitudes. This study also suggests that programs designed to reduce prejudice, such as diversity training at higher educational institutions, need to be prepared to deliver programs tailored not only to the out-group members who are the targets of the negative attitudes, but also for the value systems held by audience members. Another implication is that, social contact, alone, may not be sufficient in reducing prejudice. Instead, increasing opportunities for individuals from different groups to have positive and personally meaningful social contact may be worth considering, particularly among groups where negative biases already exist. There are many examples of activities that rely on cooperative engagement, such as Aronson's Jigsaw Classroom or Desforges and colleagues' (1991) Structured Cooperative Contact.

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Table 1

*Perceptions of immigrants by ethnic origin: results from repeated measures ANOVA and Bonferroni-adjusted paired comparisons.*

	Asian	African	Bosnian	European	Middle Eastern	Latino
Cold-Warm (N=156; F(3.7, 577.5)=14.559, $p<.001$ , partial $\eta^2=0.09$ )						
M	4.59	4.74	4.39	4.63	3.87 <sup>a</sup>	4.82
SD	1.52	1.54	1.58	1.52	1.75	1.60
Negative-Positive (N=154; F(4.20, 623.99)=14.693, $p<.001$ , partial $\eta^2=0.09$ )						
M	5.03 <sup>b,c</sup>	4.58	4.47	4.73	3.96 <sup>a</sup>	4.75
SD	1.57	1.54	1.63	1.55	1.72	1.52
Unfriendly-Friendly (N=154; F(3.80, 581.21)=15.753, $p<.001$ , partial $\eta^2=0.09$ )						
M	4.94	4.74	4.74	4.74	3.88 <sup>a</sup>	4.92
SD	1.62	1.64	1.45	1.48	1.94	1.47
Disrespectful-Respectful (N=154; F(4.09, 626.45)=17.703, $p<.001$ , partial $\eta^2=0.10$ )						
M	5.32 <sup>a</sup>	4.73	4.62	4.66	4.08 <sup>a</sup>	4.73
SD	1.51	1.48	1.48	1.42	1.85	1.61
Uncomfortable-Comfortable (N=146; F(4.27, 619.32)=15.369, $p<.001$ , partial $\eta^2=0.10$ )						
M	4.82	4.68	4.52	4.70	3.81 <sup>a</sup>	4.68
SD	1.67	1.48	1.48	1.42	1.80	1.55
Unwelcome-Welcome (N=150; F(4.08, 607.32)=15.919, $p<.001$ , partial $\eta^2=0.10$ )						
M	4.80	4.72	4.57	4.63	3.81 <sup>a</sup>	4.83
SD	1.66	1.43	1.47	1.47	1.71	1.56

*Note:* Larger values indicate perceptions that are more positive

<sup>a</sup> vs. all groups,  $p<.05$ , <sup>b</sup>vs. African, <sup>c</sup>vs. Bosnian

Table 2

*Attitudes Toward Immigrants by Race, Age, Gender, American Values and Social Contact*

	<b>General</b>	<b>Asian</b>	<b>African</b>	<b>Bosnian</b>	<b>Middle Eastern</b>	<b>European</b>	<b>Latino</b>
<i>N</i>	288	216	198	166	192	210	214
<b>Race</b> (1 = White, 0 = Non-White)	4.173*** (.212)	2.106 (.089)	.853 (.037)	1.528 (.065)	3.015 (.109)	2.174 (.108)	-1.734 (-.082)
<b>Age</b>	-.034 (-.062)	-.005 (-.008)	-.006 (-.009)	.035 (.048)	.120* (.155)	.062 (.110)	.034 (.051)
<b>Gender</b> (1 = Male, 0 = Female)	2.698** (.173)	4.361*** (.261)	.229 (.012)	2.315 (.127)	2.663 (.124)	-.326 (-.023)	1.350 (.084)
<b>Religion</b> (1=Christian, 0=non-Christian)	-.717 (-.041)	-1.663 (-.087)	-.964 (-.047)	-3.369* (-.161)	-4.810** (-.199)	-3.879** (-.226)	-2.924** (-.163)
<b>Egalitarianism</b>	.586*** (.406)	.633*** (.409)	.737*** (.443)	.741*** (.435)	.878*** (.443)	.368*** (.278)	.592*** (.395)
<b>Protestant Work Ethic</b>	-.231*** (-.229)	.083 (.075)	-.229* (-.176)	.170 (.133)	-.033 (-.021)	.222** (.227)	.051 (.044)
<b>Personal Contact</b>	.241** (.161)	.265* (.172)	.049 (.030)	-.230 (-.145)	.325* (.172)	.049 (.037)	.235* (.159)
<b>Impersonal Contact</b>	-.010 (-.007)	-.139 (-.087)	.319** (.184)	.287 (.167)	.168 (.084)	.121 (.086)	.108 (.066)
<b>Constant</b>	30.288***	20.929***	21.075***	19.315***	7.830*	22.714***	23.808***
<b>R<sup>2</sup></b>	.328	.261	.316	.211	.304	.161	.283
<b>F Statistic</b>	17.003***	9.153***	10.908***	5.258***	10.010***	4.804***	10.132***

*Note:* Standardized Beta coefficients are reported in parentheses. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed)





## Vaccine-preventable Diseases: An Examination of Measles and Polio in Nigeria\*

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## **Abstract**

Vaccination remains one of the most effective and economical public health measures for preventing disabilities and deaths. Whereas the widespread approach to the use of vaccines ensures the control of an array of infectious diseases, developing countries continue to grapple with the burdens of vaccine-preventable diseases (VPDs) with their attendant bearing on childhood mortality. This paper examines the state of affairs in Nigeria in the context of measles and polio. We argue that Nigeria still faces the health challenges posed by VPDs not only because there are social, cultural and political obstacles but largely because there has been an underutilization of epistemic resources as well as a sustained dependence on foreign sources for vaccine production and supply. Therefore, the paper suggests and explores a cost-effective approach that links the unmet vaccination needs in Nigeria to a largely Nigerian initiative towards a solution.

*Keywords:* measles, Nigeria, polio, vaccination

## 1. Introduction and Problem

Vaccination as a means of enhancing host resistance to infectious diseases remains one of the most effective and economical public health tools for preventing morbidity. It is a biomedical exercise as well as a form of social intervention which has not only ensured the eradication of small pox from the garden of human experience, (Odewumi, 2009; Søborg et al, 2009) but also continues to save millions of lives on the global plane. Its aesthetic appeal is that once people are exposed to the antigenic part of an infectious agent, their immune system responds in a manner such that they become protected from diseases associated with it. Hence, the logic of vaccination is that every vaccinated person will mount an effective immune response (Poland, Ovsyannikova & Jacobson, 2008). Additionally, vaccines are quite safe in comparison to most pharmaceutical and biological agents (Jacobson, Zabel & Poland, 2003). Although vaccination brings about the control of an array of infectious diseases, some countries continue to face the burdens posed by a number of vaccine-preventable diseases<sup>1</sup> (VPDs).

Roukens and Visser (2008) note that 90% of the annual cases of VPDs occur in sub-Saharan Africa, circulating debilitating conditions such as measles, meningitis, mumps, poliomyelitis, and typhoid fever. According to Adu (2008), Nigeria ranks 15<sup>th</sup> amongst countries with the highest cases of VPD-associated morbidity and mortality. Against this background, this paper examines the problem of VPDs in Nigeria using examples of measles and polio. Whereas hitherto attempts to understand the situation and proffer workable solutions have focused on social, cultural, and political obstacles; this paper argues that the health challenges posed by VPDs in Nigeria arise largely because there has been an under-utilization of available resources

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<sup>1</sup> VPDs are diseases for which there are either no effective treatment or for which the cost of treatment is greater than that of prevention. To be classified as a VPD, there must be an available effective vaccine for the given disease.

as well as a sustained dependence on foreign sources for vaccine production and supply. In addition, seemingly vaccinated children come down with VPDs due to lack of proper pre and post-vaccination laboratory evaluation. Ultimately, we propose a framework that takes into consideration the economic as well as the scientific dynamics of the situation.

### **1.1. Methodology & Conceptual Framework**

This paper employs the archival method of research, drawing from extant literature relevant to its thematic concerns. It frames its arguments around the use of local resources and strategies vis-à-vis solving the challenges posed by VPDs in a developing nation context. This is an approach akin to the concept of regionalization (Storper, 1997), a notion which emphasizes the utilization of resources specific to individual places to meet economic challenges. On that note, the paper links the unmet vaccination needs in Nigeria to a largely Nigerian solution.

## **2. Background to Vaccination in Nigeria**

Concerted vaccination attempts in developing countries were first attempted in 1974 via the WHO Expanded Program of Immunization (Rey & Girard, 2008). This was begun with the notion of reaching out to countries inadequately poised to meet the economic challenges posed by VPDs such as tetanus, tuberculosis, diphtheria, measles, pertussis, and poliomyelitis. However, epidemiological surveillance often showed that many Nigerian states were still confronted with VPDs such as polio (Ajao & Oyemade, 1981), measles, tetanus, and yellow fever despite the international pledge and commitment to fight the aforementioned diseases. For reasons that included the failure of this initiative, Nigeria commenced a National Program of Immunization in 1988, an initiative that largely involved the free administration of vaccines to children younger than five years. 50% of children were initially immunized, and vaccine coverage was expected to rise with time. However, coverage had gradually and drastically dwindled by early 1990 (Renne, 2006). Today, VPDs remain a major health challenge

exemplified by their attendant effects on childhood mortality as well as other associated deformities. Indeed, Nigeria is adjudged one of the least successful of African countries in achieving child survival (Ngowu, Larson & Kim, 2008) through the use of preventive strategies, such as vaccines, to reduce the burden of diseases to which this category of the population is most susceptible and vulnerable.

Perhaps, because most societies treat healthcare as an important goal of public policy (Green, 2005) Nigeria government has organized a series of National and State Immunization Days aimed at improving the national coverage (Obioha, Ajala & Matobo, 2010). Nevertheless, the Nigerian response to the low success rate of vaccination campaigns has been largely inadequate. For example, the Nigerian Government adopts a uni-perspective approach that tends to conceive these failures as resulting from under-funding. According to that stance, therefore, increases in spending would ensure increase in the rate of vaccination success. Since the Nigerian Government felt the needed funds were not available, a partnership was formed with such International corporate bodies as the WHO and GAVI for the “cheap” provision of vaccines (Agbonlahor, 2004). However, that step constitutes a subtle way of trading off the initiative for vaccination science and policy. Consequently, Nigeria is not officially responsible for the supply, security, and management of vaccines, (Agbonlahor, 2004) but has ceded the responsibility to the UNICEF. Overall, this passive battle creates an ambience for the propagation of VPDs.

### **3. Two VPD: Measles and Polio**

Measles is a viral disease which accounts for 44% of total deaths due to VPDs (Adu, 2008) which is more mortality than any other VPD (Akinloye et al, 2005). In the unvaccinated or partially vaccinated child, measles manifests clinically with pneumonia, heart failure, croup, and gastroenteritis. Although there is an effective vaccine, measles continues to take the lives

of many children in the developing world, particularly in Africa (Aaby, 1988). Empirical studies by Burstrom, Aaby, and Mutie (1993) concluded that measles is a significant contributor to infant and child mortality within the African region. Globally more than 30 million people are infected yearly. In 2004 alone, measles killed an estimated 454,000 people, of which more than 95% were located in the sub-Saharan Africa (Adetunji et al, 2007). This obviously highlights the high morbidity and mortality associated with measles.

With large and persistent outbreaks occurring with high morbidity and mortality (Adu, 2008), measles is the most common and the most severe of the acute infections of childhood encountered in Nigeria (Famulusi, 1981). A recent study by Adetunji et al (2007) found that measles cases are still commonly diagnosed in the hospital setting, and thus concluded that measles still accounts for a considerable proportion of paediatric emergencies. It is also alarming that the cohorts of susceptible unvaccinated children are at risk of contracting and causing measles outbreak in their community (Baba, Omede, Omotara & Ambe, 2007). Put simply, measles remains a threat to Nigerian children.

On the other hand, polio is a serious viral disease that afflicts the central nervous system of infants and children, causing paralysis. Between 5%-10% of those paralyzed die when their breathing muscles become paralyzed (Adu, 2008). Furthermore, it is disheartening to note that polio often gives rise to a population of people who ultimately take to begging for alms in the streets, and who in later years constitute an economic liability to the community (Ajao & Oyemade, 1981). With no specific treatment, vaccination alone (commonly through the oral polio vaccine) offers a reliable, preventive window of escape from the debilitating disease. Indeed, this preventive measure is so effective that the 53 Member States of the WHO European Region were certified polio-free more than eight years ago (Jagessar, Lazarus,

Laurent, Matic & Emiroglu, 2008), an achievement partly responsible for the reduction of the number of global polio cases.

Today, Nigeria remains polio-endemic in addition to India, Pakistan, and Afghanistan (Dutta, 2008) despite the Nelson Mandela's launch of Kick Polio out of Africa Campaign that begun in 1996 (Jegede, 2007). While most of the remaining cases of wild polio occur in Northern Nigeria (Renne, 2006), from where they have been noted to spread to parts of Central Africa and the Middle East (Katz, 2006; Pallansch & Sandhu, 2006), about 18 Nigerian States reported infection to wild poliovirus in 2005 (Obioha, Ajala & Matobo, 2010). This is a saddening situation, considering the position that Nigeria occupies in the sub-region in particular, and in Africa generally.

#### **4. Obstacles to Effective Vaccination in Nigeria**

The effectiveness of vaccines is dependent on their successful delivery from factory to lymphocyte<sup>2</sup> (Carstens, 2009). This suggests that the success of vaccines is not strictly a medical matter. Obstacles to effective vaccination may arise at the level of the "factory," which involves the quality of vaccines or the type of microbial strain used in their preparation. Obstacles may also arise at the level of the "lymphocyte," which involves the immune status of would-be vaccine recipients as well as whether or not there are inhibitory antibodies in them. From a sociological viewpoint, obstacles to successful vaccination therefore constitute those factors that impede the quality of the vaccine produced, its supply, its accessibility, its manner of administration as well as to whom it is administered. We now examine four of such obstacles in relation to how they have impeded the success of measles and polio vaccination in Nigeria.

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<sup>2</sup> Lymphocytes are specialized white blood cells that form the basis of successful vaccination by either producing antibodies (the B class) or by inducing cellular activation (the T class) which destroy the infectious agent (specific to the administered vaccine) upon subsequent exposure.

#### **4.1. Culture**

Culture constitutes an intercalation of beliefs, mores, and modes of thought inherent in (and shared) by a group of people. Tangwa (2005) describes culture as congenital tinted spectacles through which people look at reality. Health and disease form a part of the wider human social experiences. Thus, cultural and personal values would affect the recognition of illness, seeking healthcare, acceptance of and attitude towards care givers (Nelson et al, 2007). In short, culture influences health (Kogan, 1974). In the context of vaccination, certain cultural practices however seem to enhance the propagation of VPDs in Nigeria. For instance, the general population is characterized by an attitude of low regard for scientific knowledge (Afolabi 2007; Afolabi 2009b), something which is much worse in the unlettered. Thus, a number of mothers (and fathers, depending on the context of decision-making) still show reluctance in taking vaccination seriously, and do not often consent to their children receiving vaccination.

Especially in the Northern parts of Nigeria, vaccination campaigns are specifically hampered due to a cultural attitude that involves circulating false information (through the use of family and religious networks). These falsehoods range from claiming that vaccines contain anti-fertility drugs and cancerous agents (Jegede, 2007), to saying that vaccines destroy the egg of the female (Renne, 2006), thereby encumbering her reproductive function in later years. It is no surprise therefore that vaccine coverage remains low, thus encouraging the continued spread of VPDs in Northern Nigeria. This has been particularly relevant in the case of polio where there was a vaccination boycott in 2003 which was backed by state governments in Kano, Kaduna, and Zamfara states (Jegede, 2007). In that year, however, the temporary suspension of poliovirus immunization contributed to a national epidemic of poliomyelitis. Besides leaving more than 30% of children unvaccinated (Pallansch & Sandhu, 2006), the 2003 vaccine boycott



created a global health crisis (Kaufman & Feldbaum, 2009) that led to the reinfection of at least 20 previously poliovirus-free countries (Jenkins et al, 2008).

#### **4.2. Underutilization of Epistemic Resources**

Another impediment to the success of vaccine delivery is lack of optimal utilization of some of the available scientific resources. Medical laboratory scientists, for instance, are the group of healthcare providers whose professional responsibilities include the production and evaluation of vaccines. Unfortunately, this area has been almost completely abandoned in their training. Also, while there are a number of post-graduate courses in virology, hardly is there an avenue, such as a research institute<sup>3</sup>, for the practical demonstration and development of the theory as well as techniques acquired in the course of the training, especially those tailored towards vaccine production and research. As such, effective transmission of available knowledge on vaccine production and evaluation no longer occurs, or when transmitted there are insufficient avenues for their utilization; a situation that breeds brain drain.

#### **4.3. Substandard Vaccine Science**

Vaccination success has also been affected by what we here refer to as the practice of substandard vaccine science in the context of vaccination. For safety reasons, as well as for ensuring optimal vaccine efficacy, it is critical that recipients of vaccines be evaluated prior to receiving vaccines. In other words, there are scientific exclusion and inclusion criteria that ensure successful vaccination. For example, potential vaccine recipients with conditions such as myasthenia gravis and thymomas<sup>4</sup> (Roukens & Visser, 2008) are to be excluded. Nevertheless, little or no pre-laboratory screening currently takes place (Agbonlahor, 2004). For measles, another exclusion criterion is the presence of circulating haemagglutination inhibition antibody in would-be vaccine receivers (Baba, Omede, Omotara & Ambe, 2007).

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<sup>4</sup> Administering the polio vaccine to a child with myasthenia gravis may lead to vaccine acquired polio. Thus, these exclusion criteria serve the dual purpose of safeguarding would-be vaccines as well as ensuring that vaccines are given to those in whom protection can be achieved.

The implication of not carrying out pre-vaccination laboratory screening is that a sizeable number of children who should normally be excluded from vaccination are vaccinated but remain at risk for VPDs because their immune system fail to produce protecting levels of antibody to the infectious agents. Since most of these “vaccinated” children eventually become afflicted by the disease which vaccination should help prevent, the socio-cultural aftermath is that people who happen to know, or those who are told of these incidences of vaccine failure, are left doubtful of the efficacy of vaccination campaigns and programs. Indeed, events of vaccine failure negatively shape the willingness of parents to vaccinate their children (Jagessar, Lazarus, Laurent, Matic & Emiroglu, 2008).

Post-vaccination testing of vaccine recipients is also essential. Presently, this process takes place in just one laboratory in Ibadan, Southwest Nigeria. Dutta (2008) however observes that an efficient laboratory network is essential for rapid and reliable analysis of stool samples, thus a single laboratory being saddled with this task is clearly not an efficient enough way of practicing scientifically sound vaccination.

#### **4.4. Reliance on External Aid**

Reliance on foreign bodies such as UNICEF and GAVI by the Government of Nigeria for its procurement and supply of vaccines tends to impress upon the mind the false notion that the menace of VPDs is the concern of these bodies and corporations. Thus, this somehow severs a sense of responsibility on the part of the Government. That attitude however weakens the Nigerian scientific community in terms of directly or indirectly limiting the kinds of relevant vaccine research they can carry out.

One rather bitter pill about depending on foreign vaccine aid is that these agencies often feel reticent to give the same level of support when there is no crises situation (Tomori, 2004).

Coming from a former WHO Regional Virologist, this view deserves some level of attention. In addition, dependence on foreign supply means that vaccine receivers may only get partially protected or do not get protected at all if the local aetiologic agent differs considerably from commonly circulating infectious agents. It also ignores the genetically encoded tendency for the vaccine recipients at the receiving end to react to some of the substances (for example, thiomorosal, neomycin, and gelatin) used in constituting vaccines. But how can a local initiative help address the unmet vaccination needs in Nigeria?

## **5. A Modest Proposal**

Existing infections undergo frequent mutations, rendering available therapy less effective. This obviously becomes alarming for a nation like Nigeria that is yet to fully explore the benefits of vaccination, even in its traditional paradigm. In other words, there is a new paradigm in vaccinology known as vaccinomics which attempts to minimize the limitations inherent in the traditional paradigm of administering the same type and dose of vaccine to everyone regardless of gender. Briefly, the vaccinomics paradigm examines the influence of immune response gene polymorphisms on the heterogeneity of humoral, cell-mediated and innate immune responses to vaccines at both the individual and population levels (Poland, Ovsyannikova & Jacobson, 2008). It has been said that any infectious disease can be eliminated provided that it can be prevented by an effective and affordable vaccine, and that the requisite program is cost-effective (Rey & Girard, 2008). Besides cost-effectiveness, a viable approach must address such scientific issues as vaccine receivers getting sick following vaccination, failure of vaccine recipients to elicit immune response and prevent target disease, and the advent of circulating vaccine-derived viruses.

### **5.1. The Financial Angle**

Let us take a close look at the table below taken from Agbonlahor (2004) which gives a rough estimate of the amount of money Nigeria spends annually to get six vaccines.

<b>Vaccine</b>	<b>Cost (in Dollars)</b>
Oral Polio Vaccine	10, 024999.95
Yellow fever	8, 500002.82
Hepatitis B	5, 200004.80
Measles	3, 010000.00
DPT (Diphtheria, Pertusis and Tetanus)	1, 005000.00
BCG (Bacille Calmette Guerin)	1, 08000.00
<b>Total</b>	<b>28, 820007.00</b>

We gathered (from personal communication by scientists involved in vaccine research) that one third of this total cost is ample to build two laboratories devoted to the production of vaccines using indigenous microbial isolates/strains. This shows that the present stance of procuring vaccines from foreign sources is not an economically sound option. Rather than maintain the status quo, funds for vaccine importation can be gradually diverted to build well-equipped vaccine labs, preferably one at a time.

## **5.2. The Scientific Angle**

A number of scientific challenges face vaccination today. As stated earlier, the logic and apparent strength of vaccination is that every vaccinated person will mount an effective immune response (Poland, Ovsyannikova & Jacobson, 2008). This approach assumes that the same dose amount will be needed by everyone to generate effective immunity. In other words, vaccination in this paradigm ignores genetically encoded unique individual variations in response to biologic agents (Afolabi, 2009a). This limitation helps explain some instances of vaccine failure, vaccine reactions, partial protection following vaccination, and circulating vaccine-derived viruses, which are well reported in the literature (for instance: Nalin, 2002; Kew et al. 2005; Renne, 2006; Aziz, Midha, Waheed & Bhatnagar, 2007).

With this notion in mind, one can only say that the Nigerian Federal Government, as a matter of policy, needs to seriously rethink the level of commitments vis-à-vis vaccine production as well as adhering strictly to the scientific tenets of vaccination. Perhaps, the need for the latter is best exemplified by a recent laboratory evaluation. Baba, Omede, Omotara and Ambe (2007) found that there was 73% of measles vaccine failure in a North-eastern location because children that ought to have been excluded from vaccination (based on certain immune system parameters) received vaccines. Unfortunately, this means that the time and efforts invested in that exercise were in vain.

Healthcare is something in which some people must make affirmation steps and take actions to provide to those who need it (Green, 2005). In the context of VPDs, the Government of Nigerian, who often doubles as a policy-maker, does not appear to be doing enough. This may however be due to the reticent position of professional scientists in showing interest in matters of political nature. Nevertheless, policy-makers and researchers with their common interest in promoting the health of the population have the collective responsibility of working closely together in generating and using sound evidence as the basis of decision-making (Lucas & Gilles, 2003). Nigerian scientists therefore need to fashion a platform where they can exchange ideas with Government officials with an emphasis on shaping vaccine-related policies. Attempts should also be made to invite Nigerian nationals working abroad in vaccine Research Institutes for training, retraining, and collaboration purposes. Lastly, medical laboratory scientists must see to it that the art and science of vaccine production and testing are properly reintroduced into the Nigerian university curriculum.

## **Conclusion**

Since the foundations of vaccinology were laid in the 1790s (Barry, 2005), a number of nations have achieved considerable strides in employing vaccination as a tool for fighting VPDs.

Despite its human, intellectual, and material resources, Nigeria has not succeeded in the fight against VPDs such as measles and polio. Thus, of the 3.3 million children born yearly (Fed Rep Nig, 2001), a significant portion may well remain potential “biological fodders” for the rampage of these diseases if Nigeria does not rethink the current stance towards vaccine matters. An urgent need exists to re-channel and redirect existing foreign vaccine support for the furtherance of local scientific development in the arena of vaccine production and research. This, we believe, will set the country on a successful path to effectively deal with VPDs as well as other vaccine controllable infectious diseases including cervical cancer, HIV/AIDS, and malaria. Otherwise, and from a developmental viewpoint, Nigeria may have no specifically regional technological dynamic (Storper, 1997) in the context of a local structure that can effectively deal with the challenges of VPDs.

The principal obstacle to vaccination campaigns in Nigeria is in the North where religious and political leaders either completely reject or show antagonism towards vaccines on grounds that they are being contaminated in the Western world with anti-fertility agents and HIV (Yahya, 2007; Kaufmann & Feldbaum, 2009). However, one important question worth asking is this: would this animosity still be in place if the vaccines are being manufactured in Nigeria, by Nigerians, and (perhaps, mainly) for Nigerians?

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Characterizing Risky Driving Behaviors of Electric Two-Wheelers Riders To Create  
Prevention Guidelines in China and in France

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## **Abstract**

Today, Chinese people rely heavily on Electric Two-Wheelers (E2W), both the scooter and the bike styles (Cherry and Cervero, 2007), thus the production keeps growing (Asian Development Bank, 2009). This phenomenon coincides with a high rate of E2W rider mortality. However, reviewing the literature indicates a dearth of publications related to the characterization of E2W driver behaviors. In Europe, and more specifically in France, the prevalence of E2W starts to rise. In this regard, our ongoing collaborative research project, for which we introduce the framework in this paper, aims to develop new specific knowledge about the risk of E2W that would jointly serve immediate prevention needs in China and prospective prevention in France. In this paper, we first introduce the E2W's current place within road traffic and their benefits in France and China as well as the projected future growth of these vehicles. Secondly, we refer to the literature dedicated to Powered Two-Wheelers (PTW) to infer some common characterization with E2W. We continue with a description of the particular characteristic of road traffic in China. Then, we review the literature aiming to find out what defines dangerous/risky driving behaviors and how they are measured in the Chinese road context. Notably, we critically report the currently implemented tools that gauge either violation or dangerous, aberrant driving behaviors of both cars and two-wheelers. We point out a general lack of definition regarding the labels of "violation" and "risky driving behaviors." We argue the need to go beyond a classical but restrictive design in terms of errors, violations, or self/hetero aggressive intent. Finally, we suggest only operationalizing the definition of risky driving behaviors provided by Dula and Geller (2003) in relation to E2W and PTW riders.

**Keywords:** driving behaviors, risk, electric two-wheelers riders, powered two-wheelers riders, China, France, social-cognitive psychologist approach

## Characterizing Risky Driving Behaviors of Electric Two-Wheelers Riders To Create Prevention Guidelines in China and in France

The recent launch of research project seeks to meet concerns shared between France (IFSTTAR, Salon de Provence) and China (Tongji University, Shanghai) regarding Electric-Two-Wheelers vehicles (E2W or electric bikes), their vulnerability, and the risk that they entail. The broad goal of this ongoing collaborative research project is to contribute to a characterization of Electric-Two-Wheelers risky driving behaviors by adopting a social-cognitive psychological approach in respect of urban traffic planification considerations. Research studies in this project are all planned to be implemented among Chinese drivers in the Municipality of Shanghai. In this paper, we present the related relevant information which constitutes the framework and basis of knowledge of this project.

We first introduce the current position of this type of vehicle within the road traffic of France, and more broadly in Europe, in comparison to China. Additionally, their future perspective of growth is also introduced. The discrepancy of these figures illustrates that such an international research project will jointly serve prevention guideline immediate needs for the Chinese partner, and prospective prevention issues for the French counterpart by filling a dearth of knowledge in this field. Indeed, if the French road context seems favorable to the emergence of E2W, this type of vehicle is already very common in major Chinese cities. Thus, although China and France share some similar concerns and challenges for road safety regarding the E2W; the difference is that China is already confronted head-on by these problems. In this collaborative research, China (Shanghai) operates from France as a relevant observational field where risk driving conditions are in comparison to a climax.. Therefore this international collaboration experience will render the observation of some invariant

behaviors and identification of explanatory factors, that can't yet be observed or anticipated in France (beyond inter-cultural variations).

In a second part, we refer to general statements learned from literature dedicated to Powered Two-Wheelers (PTW) to construct a basis to characterize E2W driving behaviors and Chinese specificities regarding traffic road context and vehicles' interactions.

Subsequently, we investigate the literature in order to inform which definition and which operationalization are made of risky driving behaviors for two-wheelers to measure them. Such explorations lead us to critically examine currently utilized tools in China that gauge dangerous driving behaviors of both cars and two-wheelers's: The Chinese Driving Questionnaire (CDQ, Xie & Parker, 2002), the Aberrant Driving Behaviors Questionnaire (Shi, Bai, Ying & Atchley (2010), and The Chinese Motorcycle Rider Driving Violation (CMRDV, Cheng & Ng, 2010).

### **The rise of Electric-Two-Wheelers Vehicles**

Electric-Two-Wheelers driving behavior remains to be characterized. Despite the many associated deaths and injuries that have been reported in countries where these vehicles operate, very few studies, either with direct observational or self-reported methodologies, have been conducted that might benefit efforts seeking to improve safety practices among E2W riders. Yet, Europe constitutes a context of increasing E2W use. A Pike Research report<sup>i</sup> estimates that their sales will double each year until 2017 in Western Europe, while France and Italy will experience an increase of over 120%. As everywhere else in countries where this mode of transportation grows, it has been found to be an interesting alternative to other modes for urban travel for both individuals and municipal governments.

With this in mind, French manufacturers had understood the issues at stake and have developed new, more efficient models including some equivalents to 125cc class like

Electric'city, Peugeot, MBK, Emax, Kios, Matram, SEV, Sweet'elec, XOR Motors<sup>ii</sup>. Indeed, such vehicles meet the challenges for mobility presented by urban dynamics. Free from constraints of public transportation (connections, waiting time, lack of comfort, incivility) and disadvantages of private cars (parking, traffic, cost), these vehicles possess the ability to traverse relatively long distances at faster rates within urban sprawls that are increasingly saturated with traffic. They also respond to environmental considerations (fight against air and noise pollutions) and economic ones (car maintenance cost, hyper-dependence to fuel carburant).

Hence, electric two-wheelers are multiplying in France as well as in other European countries as their performance improves. New battery technologies have brought them up to 100 km, which for the daily journey is usually sufficient (Riou & Verrier, 2009). Moreover, they are also a very economical vehicle to use (0.30 € per 100 km against 2-3 € / 2 liters per 100km, for an internal combustion engine model) and are low-maintenance (no mechanical, long life batteries). While, the purchase cost is still a barrier to their deployment, some incentives are implemented locally. For example, the municipality of Paris currently offers a subsidy designed to help with the purchase of any E2W.

Similarly in China, Electric Two-Wheelers have emerged during recent years as a popular mode of transportation and are already widespread in many large cities (Weinert and al., 2007). In fact, they compose the main part of the two-wheeled traffic beside regular bicycles. They are of two different varieties: the scooter and the bike styles (Cherry & Cervero, 2007). In China, like many developing countries, clear and updated statistics are not always available regarding the distribution of vehicles types or road safety (Luoma & Sivak, 2007 *in* Zhang, Tsimhoni, Sivak and Flannagan, 2010). Although it is not recent, one official source, the Asian Development Bank, estimated in 2009 that E2W ownership in 2007 was between 33 million and 45 million (Feng, Jiang, et al., 2007; Zhejiang Bike Web 2007). Moreover, in

2010, the estimated total number of E2W was over 120 million (Xinhua news, 2010 in Wu, Yao, Zhang, 2011). It should also be noted that no category for E2W in the National Statistics Bureau data set exists. Therefore, it is difficult to determine whether E2W are counted as bicycles or small utilitarian motorcycles (which could include mopeds) or not counted at all since registration requirements differ from one city to another. Most importantly, the growth development in China of E2W is expected to keep increasing substantially, notably as a result of the progressive banishment in some Chinese municipalities of the LGP (Liquefied Petroleum Gas) and motor gasoline two-wheelers. In 2004, 13,655 regular bicycle riders died and 54,286 were seriously injured in road accidents. These statistic figures represent 12.8% of all traffic fatalities and 11.3% of injuries (CRTASR, 2004 in Wu, Yao, Zhang, 2011). Traffic safety for E2W riders is considered as an even more severe problem since the number of fatalities and injuries has increased dramatically over the past few years. In 2004, 589 E2W riders died and 5,295 were seriously injured. The corresponding figures increased to 2,469 and 16,468, respectively in 2007 (CRTASR, 2007 in Wu, Yao, Zhang, 2011). All in all, local views about E2W are quite ambivalent (Cherry, 2007) considering the current state of a growing crisis of unsafe roads that boasts a mortality rate four to five times higher than in other nations. It is in this general context that the *Road Traffic Safety Law of the People's Republic of China*<sup>iii</sup> was established in 2003 to function as the first Chinese law on road traffic safety and address the alarmingly high traffic fatality rate. Opponents of E2W often cite the number of deaths as proof of dangerousness, while others consider that this reflects their vulnerability (Cherry, 2007). Whether dangerous or vulnerable, a deeper knowledge on risk factors of E2W and their accident involvement is required, especially in the Chinese road context.



## **General statements from the literature**

Generally speaking, we can state from the Western literature that road traffic involves various users with different designs of vehicles (E2W, PTW, cars, etc) as well as various driving styles that result from the physical and dynamic characteristics of these vehicles. All these elements are likely to lead to interaction management difficulties between these users, notably between Powered Two-Wheelers riders and car drivers (Crundall et al., 2008; Hancock et al., 1990; Hole et al., 1996; Horswill et al., 2005; Jaffard & Van Elslande, 2010; Obenski, 1994; Van Elslande, 2002;). Two explanations are the potential mutual misunderstanding or ignorance of the determinants in the driving situation as well as the difficulties in taking others into account. These explanations encompass various practices among users which can be related to the physical and dynamic characteristics of their vehicle and their level of familiarity with other users (Brooks & Guppy, 1990; Comelli et al., 2008; Crundall et al. 2008; Crundall et al., 2012; Magazzù et al., 2006; Mundutéguy & Ragot-Court, 2011; Ragot-Court et al. 2011; Shahar et al., 2012; Weber & Otte, 1980).

E2W present numerous differences from other vehicles in terms of features, dynamic behavior, and the driving styles they entails. Thus the current increase of E2W will gradually but undoubtedly change the dynamics of road interaction in France and it is reasonable to state that they already have a significant impact on traffic interaction in China. Regarding what is known about the differential that PTW beget within the traffic system, and contributing to the vulnerability of their users and subsequent risk to other road users interacting with them, it is worthwhile to consider the effects of this specific differential and the risk factors generated. A myriad of determinants contribute to two-wheeled vehicles' higher rate of accidents. In particular, the relative scarcity of two-wheeled vehicles compared to cars, their narrow facial gauge, their speed and acceleration capacities, their poor maneuverability in emergency situations, and the specific behaviors that their drivers are

likely to adopt (riding between lanes in traffic jams, driving in emergency lanes or bus lanes, weaving through the traffic, overtaking by the right side, etc.) all contribute to their low detectability which can create unpredictable effects that lead to accidents (Ragot-Court et al., 2012; Van Elslande et al., 2008). Although a technical or mechanical perspective prevails for addressing road safety issues related to two-wheelers, some psychosocial determinants of behaviors by PTW drivers have already been identified in the analysis of their interactions (leading to an accident or not) . We can mention as for examples, an overconfidence about personal driving abilities, an overconfidence regarding the reliability of the vehicle driven (which may be associated with a misconception of the dynamic properties of this vehicle), a rigid attachment to the “give way” road regulation, a deficit of compliance to the traffic regulations rules (including moped), and an underestimation of risk inherent to personal driving. The literature also offers insight of potential risks elicited by individuals interacting with PTW: Erroneous evaluations made by car drivers in traffic situations involving a two-wheelers, faulty prognostics of changing circumstances, and inadequate considerations or absence of consideration about two-wheelers resulting from default of knowledge (Ragot & Mundutéguy, 2008, 2009; Ragot-Court & Van Elslande, 2011).

Despite this general statement that might apply to various countries, we must highlight the unique details of the Chinese road context that deviate from the western countries. First off, E2W are relatively absent from the road landscape in Europe considering PTW still account for less than 2% of all road traffic in term of kilometers driven. Another difference with EU countries is that the vehicles fleet consists of heavily-loaded trucks and many non-licensed motorcycles, and a large number of pedestrians (Zhang, Tsimhoni, Sivak and Flannagan, 2010). Shi, Bai, Ying and Atchley (2010) explain that since 2000, due to the increase of urbanization and motorization in China, Chinese traffic has been impacted by a massive

influx of new drivers with varied driving experience. The authors point out that due to economic and historical explanations, weak driver training and unfamiliarity with road safety rules exist. They add that after years of cycling (traditional mode), the abrupt transition to motorized mode has generated safety problems. While there are some distinctions between the two modes regarding restrictions of traffic lanes and different priority rules, Shi, Bai, Ying and Atchley assume that some drivers would reproduce the same behaviors as those practiced by bike. Thus, the settlement of the road regulations regarding infrastructures and driver training in China are still quite new and under progress. A final Chinese road characteristic regards the peculiar classification of vehicles. According to traffic laws in China, both E2W and regular bicycles are classified as non-motor vehicles despite having great differences in physical performance. Moreover, both E2W and regular bicycles are operated in the same lanes and are subjected to the same traffic rules. However, most E2W on the road exceed the performance limits of the national standard and travel much faster than regular bicycles (Weinert et al., 2007; *in* Wu, Yao, Zhang, 2011). All in all, these statements argue for the expectation of far more diverse driving behaviors in China, with associated risks to this diversity, compared to what can be observed so far in European countries such France. However, the road network in France is becoming more diverse, especially under economic and environmental considerations. More soft modes of transportation arise in the traffic. Jointly, more incentives towards electric vehicle propulsion are set on. Thus, conducting research in the field of Chinese road traffic should be considered as serving immediate needs of prevention in China and as a prospective approach for France. Under this consideration, implementing research studies in China appears to be more relevant in order to characterize E2W driving behaviors in the most comprehensive manner possible.

## **Critical review of existing definitions and items scales regarding risky driving behaviors**

The general description of the Chinese road context and its peculiarities previously elicited serves as a foundation to assess the literature. Aiming to find out what is called a risky driving behavior in regards to two-wheelers, we review how a definition is made and how it is turned into multiple item measurement scales for implementations in China.. At first a search query on Sciencedirect provides insight on the still needed publications on the topic of road safety in China at not only an international stage, but also under the social and psychological sciences approaches. A search request using “China” and “road safety” as keywords to look for in “abstract, keywords, and title” yields 19 publications results. The former publication is dated only from 2006. Within these results, targeting “two-wheelers” brings only one paper<sup>iv</sup>. Using “cycle” instead, only brings 9 papers. These searches reveal that in regards to dangerous driving behaviors, including two-wheelers riders, research studies focus on three specific driving behaviors: helmet use, red-light running and speed behaviors. Secondly, to fulfill our goal of defining risky driving behaviors for two-wheelers, we opened up our search with no limitations to also include cars as vehicles.

This search referred us to Xie and Parker (2002) who relevantly point out that some distinct Chinese cultural, personality, and attitudinal factors might also play a role on accident risk. Additionally, they mention that some classical demographic factors have been shown to carry differing impacts compared to Western populations. In this paper the authors aim to deal with driving behaviors in two Chinese cities and their involvement with traffic accidents. The driving behaviors they focus on are first mentioned as “aberrant driving behaviors,” then as “aggressive violations,” as “driving violations,” and finally “intentional driving violations.” As no definition is provided, these designations can be understood as interchangeable. In this paper, traffic road violations are both understood as intentional and aggressive. For the

purpose of their study, Xie and Parker (2002) make use of the Manchester Driver Behaviour Questionnaire (DBQ) initially developed by Parker, Reason, Manstead and Stradling (1995) for Westerner drivers population. According to the DBQ items, the risk linked to traffic accident occurrences is strictly operationalized as violations, lapses, and errors. References to the road regulation are obvious. Based on the DBQ, Xie and Parker develop the Chinese Driving Questionnaire (CDQ). It covers culture-specific topics that emerged from interviews and literature reviews. Respondents express their agreement with 40 statements related to the importance of social hierarchy, the road safety measures, attempts to escape the sanctions, and the questioning of the lawful authority by some drivers who first think first of their own interests rather than safety. Additionally to the development of the CDQ, the authors added an extended set of driving violations relevant in China. This extended version of the DBQ refines categories as errors and lapses, aggressive violations, lane-use, inattention errors, maintaining progression violations, and signaling of impatience. Through scrutinizing these factor labels, one can question why this idea of (intentional) aggression only appears in the second violation factorial items group and not in another one. It appears as quite debatable for many of these items: "Chase a driver who angered you," "Get involved in unofficial races," "Race away from traffic lights," "Overtake on the inside," "Break speed limit," "Drink and drive," and "Show an aversion to other road users." When even the DBQ itself is noticed as the "DBQ aggressive violation scale," we defend that those driving behaviors are over-interpreted as intentional aggression. Since contextualization of the driving situation often lacks in these items, it makes them imprecise. As an example, "Race away from traffic lights" can correspond to a judgmental or perception error as well as an intentional aggression. Another example is "Break speed limit." Instead of a willingness to appear aggressive to another driver, the action could correspond to a sensation seeking need. In this regard, Xie and Parker themselves mention in discussion about variability of the results according to age

of the sample, a study of sensation seeking in a Chinese sample by Wang et al. (2000). Beyond an aggressive intention, Shi et al. (2010), referring to Xie and Parker, describe this driving behavior as an emotional response instead.

Finally, this above critical analysis brings us to defend a methodological point of view. Any intentional aggressiveness, ignorance, sensation seeking, personality influence, cognitive, social, or cultural factors, or any explanatory factors of traffic rules violations should be independently measured from the (risky) driving behaviors themselves. Reducing violations items to intentional aggression motives represents a restrictive or bias approach that does not allow investigation on further explanatory factors.

More recently, Shi, Bai, Ying and Atchley (2010), conducted a study among Chinese drivers in Beijing city. The authors sought to understand the nature of aberrant driving behaviors. Despite a lack of definition, since the authors refer to Reason et al. (1990) it is clear that these behaviors must be understood as violations (intentional) and errors (non-intentional behaviors). They aim to compare self-reported driving behaviors of Chinese new set of car drivers with those that we know in the West. Rather than make use of current tools used in Western countries, the authors highlight the need to develop a “localized Chinese and standardized version of the DBQ” to be applied everywhere in China. They acknowledge Xie and Parker’s (2002) CDQ development and its combination with the DBQ as an excellent innovation for discovering new predictors. Nevertheless, they argue that these predictors may have changed in the last decade. Their point of view is that “interpersonal network” and “social hierarchy,” which are the two most important factors in the CDQ, are no longer valid for the new generation of Chinese drivers. The authors also assume that the increased number of drivers who switch from bicycle to car should generate the identification of more “self-willed” behavior from these new drivers. Therefore, Shi et al. take the opportunity to develop

an updated tool. All in all, this new measure incorporates about 25 items of violations and errors. Six items from the extended DBQ (Xie & Parker. 2002) and nine from the original DBQ (Reason et al. 1990) having been shown to be related to accidents are included. Ten new items are designed from prior interviews. Factor analysis reveals five factors: “Emotional Violation,” “Risky Violation,” “Distracted Error,” “Self-willed Violation,” and “Inexperience Violation/Error.” Interestingly for our purpose, with the exception of “Inexperience Violation/Error,” all these violation factors are assumed as deliberate, intentional behaviors. Debate ensues when reading some items that lack of context to determine whether the behavior is intentional or not. The disparity between items for each factor creates ambiguity regarding categorization. Furthermore, errors are presupposed to be due to distraction or inexperience. Yet errors while driving are not that restricted. For example, failure to notice a pedestrian crossing can sometimes be due to the low cognitive conspicuity of pedestrians.

Finally, Cheng and Ng (2010) appear as the only researchers to focus on Chinese motorcyclists. To properly explore this realm, they could have develop an adaptation of the Motorcyclists’ Riding Behavior Questionnaire (MRBQ, Elliott et al, 2007; Özkan et al. 2011). Distinctively, the MRBQ is only dedicated to motorized two-wheelers while the DBQ and the CDQ questionnaire focus on car drivers. The MRBQ reveals that motorcyclist behavior corresponds to a five-factor structured model: traffic errors, control errors, speed violations, performance of stunts, and use of safety equipment. However, the MRBQ, as among other current measures, has been developed in Western countries and mainly in the English language. Cheng and Ng share Xie and Parker (2002) as Shi et al. (2010) ’s point of view (2002) that contextual factors in terms of social, cultural, and traffic environments could also influence the driving behavior of Chinese drivers, especially their tendencies of

violation. Hence, they argued the need for an *ad hoc* measure to evaluate driving violations of motorcycles in China. They aimed to “locally develop” such a questionnaire. With these objectives in mind, they designed the Chinese Motorcycle Rider Driving Violation (CMRDV) scale. It consists of 19 items. The purpose is to assess the driving violations of Chinese motorcycle riders and evaluate its screening accuracy between accident-involved and accident-free motorcycle riders. Nevertheless, one could counter-argue that the authors’ goal is not yet fully actualized. Indeed, in China the idea of “locally developed” can suffer some significant regional differences, even cultural ones. In Cheng and Ng’s paper, Chinese riders are clearly quoted as from mainland China, Taiwan, and Hong Kong. However, the methodologies of the scale development and the test phases have been exclusively driven in Hong-Kong. A working group including a principal motorcycle driving instructor from the Hong Kong School of Motoring, a commercial motorcycle accident avoidance instructor, a high experienced licensed motorcycle rider, and two expert instructors have been involved for the CMRDV items generation. A final sample of 680 Hong Kong riders of motorcycles with an engine capacity between 50cc and 250cc composed the population for the test of the full survey questionnaire. The items of the CMRDV are designed in traditional characters and some of them are expressed in a typically Cantonese way of oral talking. Such a detail appears relevant since despite the fact that official languages are English and Chinese (Mandarin or *Putong hua*), Cantonese (or *Guangdong hua*) is acknowledged as the *de facto* official spoken variety of Chinese language in Hong Kong. In fact, 97% of the population in Hong Kong speaks Cantonese and it is the main variety of Chinese language used in education, broadcasting, government administration, legislature and judiciary as well as in daily social communication. However, in Mainland China Mandarin dominates. That makes a significant difference in the selection of a tool to measure driving behaviors. Additionally, it should be disclosed that some differences exist between Mainland China and its Special



Administrative Regions regarding the level of traffic regulations, the advancement of the road infrastructure, and traffic directions. People drive on the left side in Hong-Kong and Macau while on the right side in Taiwan and Mainland China. Therefore it seems quite premature to reach the conclusion, as claimed by the authors, that the CMRDV can be applied to any Chinese Motorcycles riders driving behaviors. Also, unlike most studies, Cheng and Ng do not take into account the very wide diversity of motorcyclists in their data analysis and comments (Mundutéguy & Ragot-Court, 2011). Indeed, their sample gathers riders of vehicles with engines between 50cc and 250cc, which covers a range of differences regarding physical and dynamics properties. After all, electric two-wheelers themselves can be scooter or bike styles. However, no data analyses are introduced under this distinctive feature. Finally, the authors do not include in their sample riders with less than three years of experience with two-wheelers. While two-wheelers new drivers have distinctive driving behaviors and an higher accident records according to the Western literature, one could question the representativeness of the results. Furthermore it has been shown that there is a higher risk of young motorcyclists getting involved in accidents, including those of high severity (Huang & Preston, 2004; Kraus et al, 1976 ; Mullin et al, 2000 ; Nakahara et al, 2005 ; Yannis et al, 2005; Zambon, & Hasselberg, 2006a). Even if driving experience is also a significant factor to explain accidents, (Sexton et al., 2004) young age is a factor that comes first (Taylor & Lockwood, 1990). Rutter and Quine (1996) illustrate through the identification of the willingness among young people to break the law and violate rules of the road traffic.

### **Towards a more comprehensive definition of risky driving behaviour**

Following our review of the literature, our main statement is that there is currently no available definition about what constitutes risky or dangerous driving behaviour for two-

wheelers, either electric or not, both for Chinese and Western studies. Generally, literature about driving behaviors, as linked to road accidents, does not provide a formal definition. Even more, there are no standard designations between different research papers or within any one research paper. “Aberrant driving behavior,” “intentional driving violation,” and “interpersonal aggressive violation” are alternatively, and even confoundingly, mentioned to designated driving behaviors related to accidents. Our observation is consistent with the systematic content analysis presented by Dula & Geller (2003). Following the objective to clarify imprecise definitions of what comprise dangerous driving behaviors, the authors suggest that dangerous driving behaviors are ones that endanger or potentially endanger others. They identify three main categories of dangerous driving behaviors: (a) intentional acts of bodily and/or psychological aggression toward other drivers, passengers, and/or pedestrians (acts may be physical, gestural, and/or verbal in nature); (b) negative emotions felt while driving (including frustration, anger and rage, but which might also include sadness, frustration, dejection, jealousy, etc.); and (c) risk-taking behaviors defined as dangerous behaviors performed without intent to harm self or others. This third classification includes such behaviors as speeding, general tailgating, running red lights, weaving through traffic, maneuvering without signaling, and frequent lane changing.

Following our goal to characterize risky driving behaviors of electric-two wheelers, first in the Chinese road context, we suggest reliance on Dula and Geller third level definition of dangerous behaviors. Once reformulated, it follows: *One driving behavior is risky if it (potentially) puts in danger oneself or endangers others in the traffic system, out of self/hetero aggressiveness and out of negative emotions felt while driving.* The adoption of this definition will allow us to go beyond the usual violations/aggressive intention and errors approaches of aberrant driving behaviors as they relate to accidents, especially when it is debatable that these last ones can be procured through self-reported method. The interest is

to further explore factors that explain these dangerous driving behaviors. These exploration would include a separate measure of aggression intention as an explanatory factor among others. Already some individual and personality trait factors have been explored, such as the well-known sensation seeking trait. However, social, psychological, and cultural factors still warrant investigation.

We also demonstrated no available measure exists that sufficiently gathers the features of measuring risky driving behaviors of two-wheelers without neglecting the specifics of the vehicle driven (type and categories of two-wheelers for example), and additionally being “locally” adapted to the Mainland China traffic road context and therefore in the Chinese language (meaning Mandarin). A continuation of our ongoing research program will entail the development of this still missing self-reported questionnaire according to the definition of risky driving behaviors we introduced. Moreover, according to the peculiarities of the Chinese road context (road sharing between drivers with and without driving licenses as well as the recent modal shift of often non-motorized to motorized vehicles for drivers of various ages), we think the design of such a tool should avoid any driving regulations references in the risk-taking behaviors items.

## **Conclusion**

In this paper, we explained how Electric Two-Wheelers vehicles have not yet been characterized, despite being sold at a break-neck pace. This is largely due to China’s booming market. Since this phenomenon coincides with a high rate of E2W riders’ mortality, futures research studies should embrace the goal to develop innovative knowledge in this field. Allowing the creation of preventative guidelines, or prospective guidelines in countries where this type of vehicles only starts emerging, is vital. Our current international collaborative research project contributes to this broad objective.

Generally speaking, aspects related to human factors in road safety issues are still lacking in China. Thus the approach we suggest is valuable since it allows going beyond the technical and mechanical components concerning the general question of urban mobility. Our critical review introduced in this paper provides a first step. We defend the need to take the specifics of the local context and the evolution of transport mobility into account during the investigation of driving behaviors. Finally, the development of an ad hoc tool to measure risky driving behaviors of the two-wheelers in China shall be readily applied to in emerging countries or European countries in the future.

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## Footnotes

<sup>1</sup> <http://www.dealernews.com/dealernews/article/research-world-sales-electric-two-wheelers-set-explode>

<sup>2</sup> <http://www.scooter-system.fr/guides/1-scooter-electrique.html>

<sup>3</sup> [http://english.gov.cn/laws/2005-09/07/content\\_29966.htm](http://english.gov.cn/laws/2005-09/07/content_29966.htm)

<sup>4</sup> Changxu Wu, Lin Yao, Kan Zhang, The red-light running behavior of electric bike riders and cyclists at urban intersections in China: An observational study, *Accident Analysis & Prevention*, Available online 2 July 2011, ISSN 0001-4575, 10.1016/j.aap.2011.06.001. (<http://www.sciencedirect.com/science/article/pii/S0001457511001679>)

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Sustainable Affordable Housing Provisions for Young Urban Households in Chinese Cities  
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**Abstract**

The rate of homeownership in Chinese cities increased from less than 20% in the 1980s to 82% in 2007. However, such a high rate mainly resulted from the welfare housing policy which was abolished in 1998. In recent years, it has become much more difficult to become a homeowner in China, particularly for the 1980s generation who neither could qualify for public rental housing units nor afford private houses for self-use in urban areas. The sharp hike in housing prices in the past few years in Chinese cities has made homeownership a great challenge to lower income groups. The purpose of this paper is to discuss the challenges of promoting homeownership among young urban households. This paper also offers suggestions regarding sustainable housing provision for them.

**Keywords:** homeownership, young urban households, housing reform, Chinese cities

## **Sustainable Affordable Housing Provisions for Young Urban Households in Chinese Cities**

According to Tan (2011), housing is a human right and a basic need that must have priority. Housing is not a homogeneous good as compared to other goods such as food, or clothing, but is composed of thousands of households in different locations. Housing provision is one of the major challenges faced by many developing countries, and China is not an exception. Despite efforts by the Chinese government to promote homeownership, an enormous number of issues relating to the housing delivery system still exist that have undermined the success of housing reform for the past 30 years.

Over the years, housing provision has always been an important agenda for the Chinese government because it is a visible output where the development can be seen. This in turn creates jobs and generates taxes and wages that positively influence the quality of life (Sheng & Fang, 1999; Kim, 2004). Furthermore, the property industry is a significant sector of the high growth of the Chinese economy, contributing more than 5% growth to its GDP since 2008 (National Bureau of Statistics of China, 2008). Buying a house has a powerful consumption multiplier (Leung, 2004). The economic impact of housing does not end when a home is sold and the new house owner moves in. In fact, through activities such as furnishing, decoration, renovation, repairs, home appliances, or landscaping, housing continues to be an economic force long after the sale is closed (Tan, 2008). Macroeconomic modeling in the United States suggests that the consumption multiplier is between 1.34 and 1.62 in the first year or two after the purchase of a new home (Tan, 2010a).

The efficiency and effectiveness of the housing delivery system requires sustainable housing provision for all. It has become much more difficult to become a homeowner in China (Yang, 2010). In addition to low income groups, disadvantaged groups may include young Chinese households in urban area aged between 25 and 34 years. The housing needs of this age group will continue to increase because young households, who were born after the 1980s, have started to form their own families. Generally, the proportions in the age group 25-29 and 30-34 years old constitute an important and active segment of the population in terms of household formation (Saw, 2007).

With prices of houses at an all-time high, especially in Chinese cities, the environment has become difficult for young urban homebuyers born after 1980 to own property. Most of them have problems financing the purchase of homes without the help of their parents or relatives. In fact, most of young urban families are getting married without owning a house. 'Naked marriage' is a rising phenomenon and has become a social problem in China (Xu, 2013). This social disparity could become a source of discord among the younger generation. In the face of the high cost of living and inflated property prices, the government should pay more attention to ensure young urban households have a roof over their heads.

Given the sharp hike in housing prices in the past few years, the government, however, has taken measures to curb speculative activities in the housing market. The recent government intervention has made homeownership a great challenge to young urban households who neither qualify for public rental housing units nor are able to afford commodity housing for own use in Chinese cities. In an effort to meet basic housing need for low and middle income groups, housing policies and programs must be formulated to ensure that all Chinese have access to adequate housing. In the 1994 reform, the Chinese government created the



Economical and Comfortable Housing program (ECH: *Jingji Shiyong Fang*) as part of the housing supply system. This program has become a major source of affordable housing as the Chinese government is committed to building the ECH as part of its effort to satisfy 80% of Chinese households in urban centers (Deng, Shen, & Wang, 2011). Furthermore, the ECH program has to become an important social agenda to address the steep housing prices and rising cost of living if societies are to continue to be functional and sustainable. Since the ECH should be made available to the majority of urban Chinese households, this paper only focuses on the affordable housing provision issue. High cost housing and rental housing are not examined in this paper. This paper is undertaken to study the cloud of issues relating to affordable housing available for young urban households in China.

## **Methods**

This research draws data and information from a variety of statistical yearbooks, literature, reports, and property news to discuss sustainable affordable housing provision in China. A review on the housing delivery system in the context of China is conducted. The aim of this paper is to address the following questions: how successful is the Chinese government in meeting the housing need of most young urban households? If not successful, what are possible ways to achieve sustainable housing provision in the country? In order to answer these questions, this paper is organized as follows. The paper will first look at the development of China's housing reform for the past 30 years to give the necessary background of housing problems in China. This investigation will be followed by the discussion of issues regarding homeownership for young urban households. The third section will examine China's affordable housing program to determine how effectively the Economic and Comfortable Housing Program (ECH) has been used to promote homeownership. Next, this paper will highlight possible recommendations for the homeownership program with

regard to the concept of sustainable housing provision. The final section of this paper presents conclusions.

### **Housing Development in China**

Homeownership is beneficial not only to households but also societies (Cummings, DiPasquale, & Kahn, 2002; Dietz & Haurin, 2003; Tan, 2010b). Benefits of homeownership to both owners and society can be found in many housing studies, ranging from social benefits to economic benefits. Haurin, Parcel and Haurin (2002) and Tan (2008) prove that homeownership improves the home environment in which a child lives, improves the child's cognitive ability, and reduces behavior problems. Balfor and Smith (1996) and Rossi and Weber (1996) both point out that homeownership increases household members' self-esteem and life satisfaction. Increased parental self-esteem has resulted in a greater emotional support for the homeowners' children. Green and White (1997) also find that children of homeowners stay in school longer than children of renters. Tan (2009) and Tan (2012) confirm that a higher rate of homeownership is often thought to promote neighborhood stability. Glaeser and Sacerdote (2000) support their views as homeownership creates incentives for homeowners to improve the quality of their communities and also to improve homeowners' connection to their neighbors. From a financial perspective, it has become important to consider homeownership as an investment for which homeowners will receive an attractive and positive financial return. Besides the financial return, owning a house has proved to be an effective instrument to hedge against inflation as compare to other assets (Tan, 2008).

The rate of homeownership in China increased from less than 20% in the 1980s to 82% in 2007 (Huang, 2004; Huang & Yi, 2011). However, such a high homeownership rate was due

to the welfare housing policy which abolished in 1998. China's public housing system was traditionally characterized by a centrally planned welfare system. Under the welfare system, houses were allocated to the employees who worked in state-owned enterprises (work units). Employees were only required to pay a nominal rent. The old housing distribution system, however, failed to provide adequate housing for all because the rent received was not sufficient to cover the maintenance cost of public housing stock. The Chinese government decided to stop the welfare system and implemented a market-oriented reform by allowing households who had access to public rental housing to purchase their units at subsidized prices starting from the 1980s. At the same time, the Chinese government gradually increased the rent for urban households who could not purchase highly subsidized units. However, this reform was not well received by most households as they could not afford to buy the houses owing to their low salaries. Furthermore, the work units are still actively involved in the housing distribution as part of their responsibilities (Deng et al., 2011).

The establishment of a functional housing market only came in 1994 when the government decided to advance the entire housing process of production, distribution, and consumption (Zhao & Bourassa, 2003; Huang & Yi, 2011). For example, different types of housing are supplied to the market. High income urban households would purchase commodity housing from the market, while middle and low income households would purchase subsidized affordable housing through various affordable housing programs such as the Economical and Comfortable Housing Program (ECH). The government also established a housing finance system in which households could get either unsubsidized mortgage loans by commercial banks or subsidized mortgage loans through a compulsory housing provident fund (HPF). HPF is a mandatory housing saving program in which employees and employers both

contribute a certain percentage of employees' salaries to HPF accounts (Zhao & Bourassa, 2003; Deng, Zheng, & Ling, 2005).

The Chinese government continued its effort to privatize the housing system by introducing the concept of full and partial property right. As stipulated in China's constitution, the transfer and circulation of land ownership by private households is prohibited. With the recent housing reform, homebuyers can purchase a 70-year land-use right for residential purposes. Homebuyers who purchased previously public housing at market prices are entitled to full property rights, which include right of occupancy, right to dispose through resale, and right to transfer the property to others. But, they have only partial right if they purchased previously public housing or private housing at subsidized prices (Hou, 2010).

The objectives behind all these initiatives, however, were not fully accomplished. Chinese households have been accustomed to the old system of housing allocation. Instead of buying units from the market, they continued to rely on their work units for housing allocation by purchasing units at discounted prices (Wang & Murie, 1996). This purchase behavior has significantly distorted the functioning of the market mechanism in both housing production and consumption. In 1998, the Chinese government decided to cut the link between work units and housing provision. Work units were not allowed to buy housing units in the market for their employees, but contributed either through cash-based housing subsidies or cash contributions to the HPF to assist home ownership. In an effort to improve housing affordability by supplying quality affordable housing in urban areas, the Chinese government proposed to expand the ECH program which was introduced in 1994 to target low and middle income groups to acquire their homes. For migrant households who suffer from housing poverty, the social rental housing sector was developed to cater to their housing needs.

## **Challenges of Promoting Homeownership for Young Urban Households**

The market-oriented reform in 1998 completely changed the role of work units in housing provision. One of the great achievements of the housing reform was the transformation of homeownership from collective ownership to private ownership. According to the report in the National Bureau of Statistics of China (2004), the change in the purchased housing units in terms of the total floor area has increased extraordinarily from 287 million square meters in 1991 to 946 million square meters in 2003.

Despite efforts by the Chinese government to provide adequate and accessible houses to all levels of society, the market-oriented reform has contributed to the problem of housing and income inequality (Ye, Song, & Tian, 2010). Mainly low and middle income groups do not qualify for public rental housing units and cannot afford commodity housing in the market. As a result, home purchase is a distant dream for buyers whose income barely exceeds the ceiling for application for public rental housing.

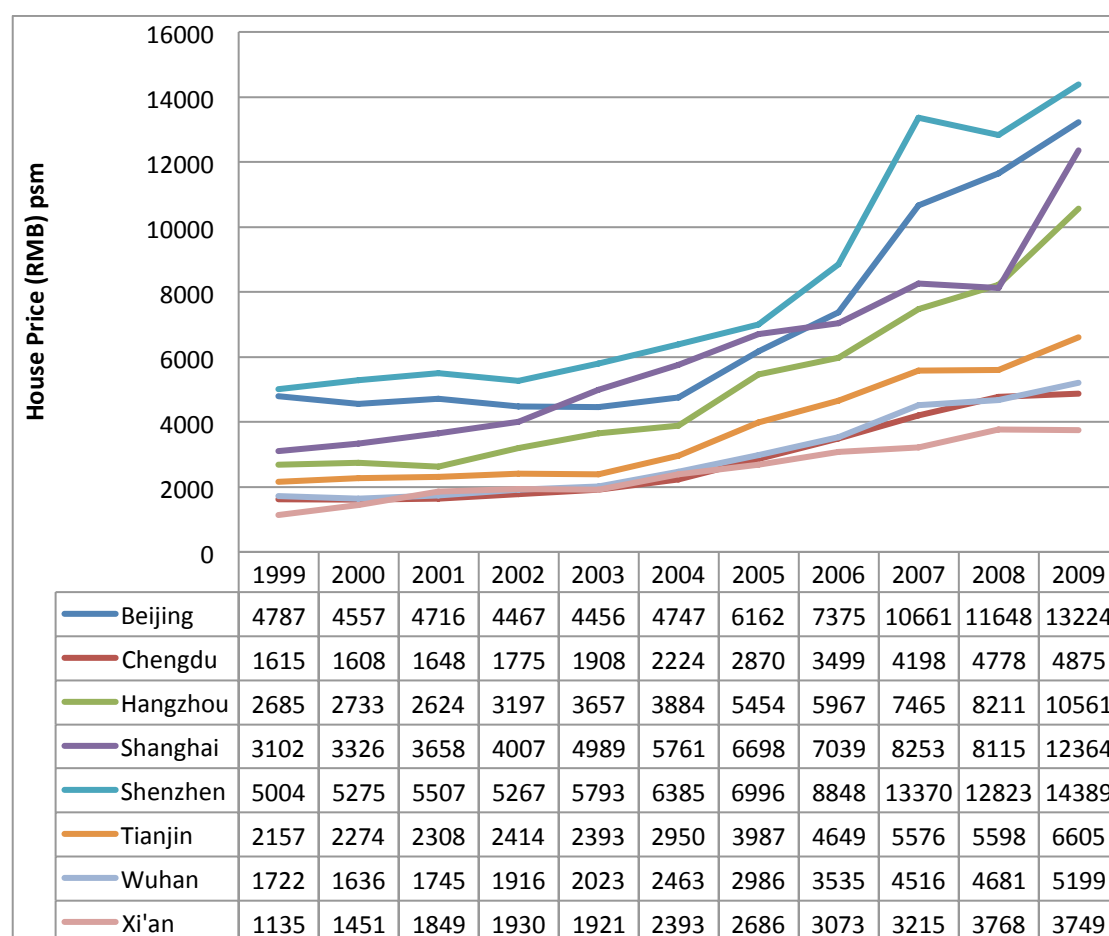
In recent times, it has been a stretch for the average Chinese to purchase a house. Rising house price pressures appear to be a significant challenge to the efforts to increase homeownership among young urban households with comparatively lower income. For example, the average housing prices increased by 176% in Beijing, 299% in Shanghai, 293% in Hangzhou, 188% in Shenzhen, and 230% in Xi'an in the period between 1999 and 2009 (National Bureaus of Statistics of China, 2010). Figure 1 shows house prices across eight major cities in China.

One of the main factors contributing to the high prices of houses in Chinese cities is the strong urbanization development in China (Ye et al., 2010). Fast urbanization has caused the

urban population to increase during the last decades. In 1980 the population residing in the urban centers numbered 19.4% as against 80.6% in the rural area. Since then, a pronounced shift in the population between these two areas has occurred, with respective proportions moving towards 26.4% and 73.6% in 1990 and 36.2% and 63.8% in 2000 (Figure 2). According to the latest census conducted in 2009, the population living in the urban area had increased to 46.6%, while the number in the rural areas stood at 53.4% (National Bureau of Statistics of China 2010).

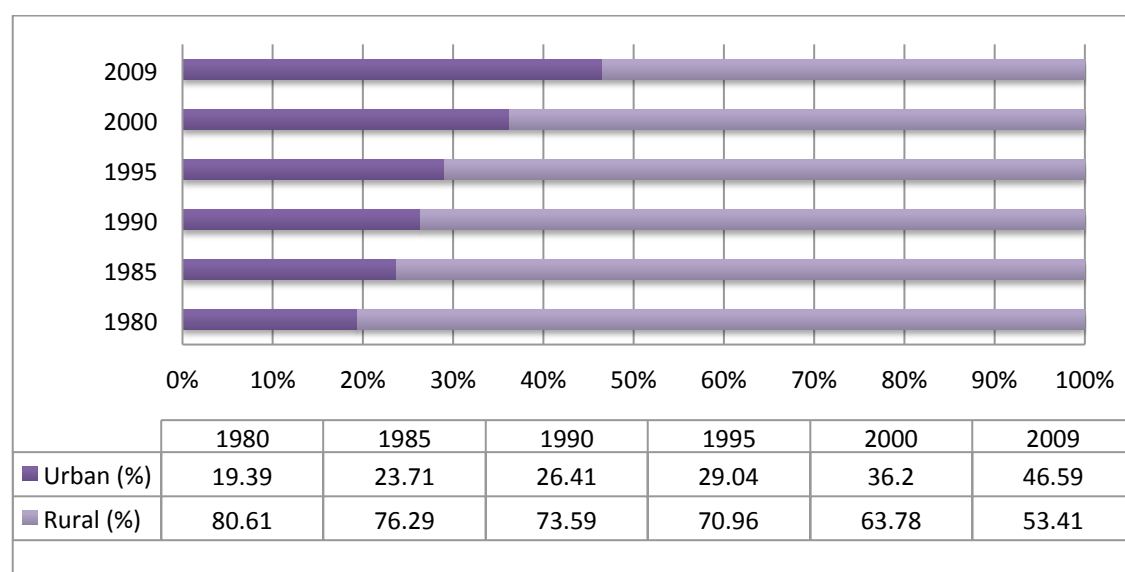
The rapid increase in the urban population throughout these years can be traced partly to the movement of people from the rural sector to the urban conurbation and partly to the relocation of small town dwellers to the bigger cities. This urbanization trend, a common worldwide phenomenon, has been exerting intense pressures in the urban conurbations with regard to meeting the essential needs of the dwellers, particularly housing (Wang, Wang, & Bramley, 2005).

**Figure 1: House Prices (RMB per square meter) in Eight Major Chinese Cities**



Source: National Bureau of Statistics of China (2010)

**Figure 2: Urban and Rural Population Proportion in Percentage (1980 – 2009)**



Source: National Bureau of Statistics of China (2010)

With the rapid urbanization process, the land supply area has decreased in most Chinese cities. This has resulted in the expectation of the decrease of land supply in the future. The decreasing land supply has a significant negative effect on home prices (Yu, 2010). As pointed out by Mengjie, Reed and Hao (2008), the estimated growth in land prices is almost an eight-fold increase since 2003. Another contributing factor to the land price is due to the land lease policy (Deng et al., 2011). In China, the state government has completely monopolized the land supply. Lands for residential and commercial use can only be transferred through bidding, auctioning, and listing if housing developers would like to undertake housing development projects. Long before 2002, land leases were normally conducted in a closed door manner. This type of the closed-door negotiation, however, was easily susceptible to corruption and lack of transparency in land deals. As a result, the government terminated the transfer of land through closed-door negotiations. As shown in Table 1, the ratio of the land leased by tendering, auction and listing went up from less than 17% in 2002 to 45% in 2008.



**Table 1: Types of Land Lease (Total Transaction)**

Year	Land Area Leased (Total)	By Tendering	By Auction	By Listing	Percentage of Land Leased by Tendering, Auction and Listing
1999	99,017	2,682	12,643	-	15
2000	108,846	3,357	15,875	-	18
2001	170,157	4,509	20,426	-	15
2002	242,763	8,270	24,901	5,726	16
2003	207,387	3,067	18,499	28,440	24
2004	184,850	1,540	14,540	30,659	25
2005	162,112	1,542	13,495	29,433	27
2006	186,667	953	12,724	32,057	25
2007	160,404	884	10,190	39,582	32
2008	123,358	1,074	10,085	44,106	45

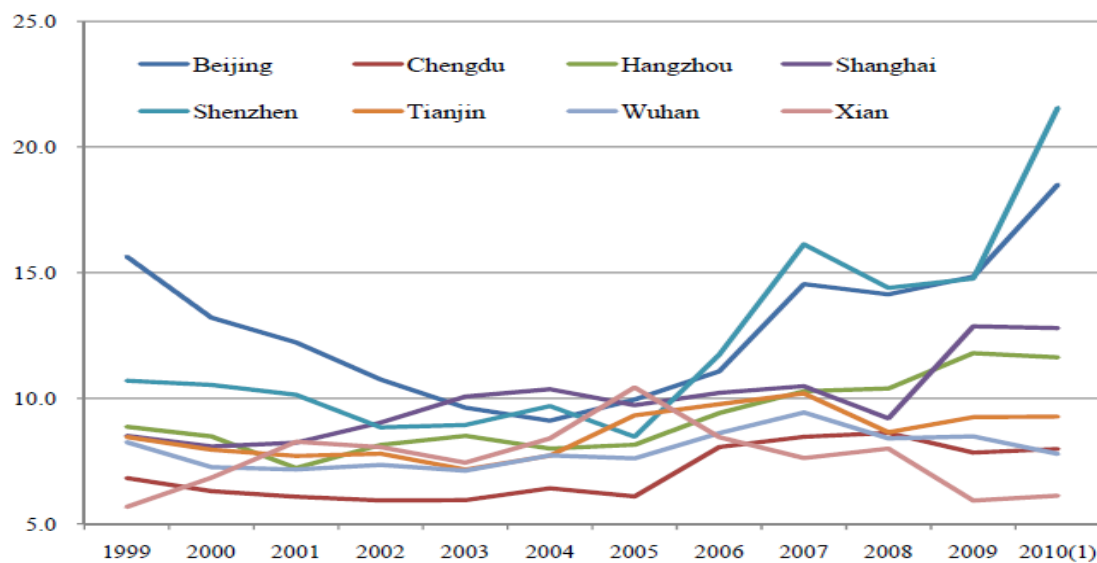
*Source: Ye et al. (2010)*

Although the income of the average household in urban areas is increasing, it appears that house prices have been rising at a faster rate, causing an affordability problem. Homebuyers are believed to encounter housing affordability problems when they are required to pay a large portion of their income to achieve adequate levels of housing. The house price to the median annual household income ratio constitutes the most commonly used affordability benchmark (Tan, 2011; Peattie, 1987; Mengjie et al., 2008). It is commonly accepted that a desirable Price-to-Income Ratio (PIR) ranges between 3 to 6. This ratio depends on individual cities and their actual locations. If the ratio is above 6, it has surpassed the general affordability for one to own a house.

Although China's housing reform has enhanced the efficiency of the housing delivery system, it has also created increasingly unaffordable housing prices. Over the past few years, house price appreciation has outpaced the high income growth in urban areas (Hou, 2010; Ye et al., 2010). The most recent data show price-to-income ratios have reached their highest levels ever in Chinese cities. As shown in Figure 3, PIR in Shenzhen, Beijing, Shanghai and Hangzhou are above 10, indicating the mismatch between income and prices is considered one of the biggest obstacles to increasing homeownership among young urban first-time homebuyers.

Although state-owned work units are not allowed to build and buy directly for their employees, they continue to play a significant role in their employees' housing consumption by taking land and housing development projects. Some of the housing developers in China come under cooperative housing development that is supported by state-owned work units (Wang et al., 2005). These work units were interested in setting up a subordinate real estate development company because it could easily raise the start-up capital to finance the housing development projects for their employees through a pre-sale process (Wang et al., 2005). Due to the strong link between work units and local government, these state-owned work units' (SOE) developers could acquire land easily through free allocation or purchase at very low costs from the local government. Many of those spin-off development companies have later grown into large private housing developers in China (Zhao & Bourassa, 2003; Wang et al., 2005).

**Figure 3: Price to Income Ratio in Eight Major Chinese Cities**



Source: Wu et al., (2010)

Affordability conditions in Chinese cities are highly related to SOE developers' involvement in land bidding. As mentioned earlier, the Chinese government has completely monopolized the land supply, and the housing market was not recognized on the basis of private land ownership. All urban lands for residential and commercial use could only be transferred through bidding, auction, and listing. SOE developers generally paid the highest prices to win the tender. As reported by Wu et al (2010), the average price of land parcel by the winning SOE developers was 2.7 times higher than the average price of land parcel by non-SOE developers. The involvement of state-owned work units in the housing delivery in Chinese cities is very common, particularly Beijing (Huang, 2004). This has distorted house prices by basing work units on their ability to pay more than urban households. The continuous participation of work units, in fact, has resulted in the increasing housing inequality in China, and this could be a major cause of low homeownership among the low income urban families.

## **Affordable Housing Programs in China**

Rising house prices are evident in the property market around the world. In less than a decade, house prices have increased to levels that are out of the reach of the lower income group. This seems to be the situation faced by many countries in different continents of the world today (Kim, 2012). During such time, more affirmative policies need to be undertaken by the government to help young urban households overcome the difficult and challenging times. As mentioned earlier, the Chinese government started to expand the housing supply system to improve housing availability for its urban dwellers by offering various types of housing schemes, such as commodity housing, the Economic and Comfortable Housing Program (ECH), and public renting housing (subsidized renting housing). Private housing by housing developers sold at market price is often called commodity housing, which offers house buyers full property right. ECH, on the other hand, are built to serve lower-middle and middle-income urban households who may not be able to purchase commodity housing (Yang, 2010). Affordable houses are developed by private housing developers with the support by local government in terms of development subsidies (Yang & Yue, 2008). In the case of Beijing, private housing developers can become involved in the provision of affordable housing by either acquiring the housing contracts in special projects, or turning the second-hand market housing into affordable housing (Ye et al., 2010).

The price of ECH is controlled and regulated by the local government in the following ways: (a) free or low-cost government land for development, (b) no administrative and development charges, (c) waiver of half of real estate taxes and (d) keeping developer's profits at no more than 3% of the development cost (Niu, 2008). There are no significant differences between ECH and private commodity housing in terms of housing characteristics such as location, period of construction, housing size, number of rooms and plot ratio (Pan, 2003). The only

difference is the average price of affordable housing, which is 40% to 50% lower than the average market price for all housing units (Deng et al., 2011).

Although affordable houses are built to help middle and lower-middle income groups, these houses still remain out of reach for the targeted group. Due to the lax and ineffective enforcement of qualifying households into the ECH scheme, a lot of affordable house are frequently sold to families who can afford commodity housing instead of families who genuinely need help for basic housing. It is known that the qualifying requirements of the affordable housing program are different for many cities. As highlighted by Ye et al (2010), the qualifying standards for purchasing economical and amenable housing in Beijing include the following: (a) homebuyers have to be local residents who have more than 5 years of registered residency in the city, (2) total assets limit, (3) age requirements, and (4) per capita living space below prescribed standard.

Because of a lack of investment options in China, affordable housing has become an investment tool for some high-income Chinese (Yang, 2010; Mengjie et al., 2008). Despite three decades of housing reform, people's political power continues to be important factor in determining housing consumption. In some cases, high-income households with high political status who are in resourceful work units as well as have party membership are more likely to easily purchase affordable housing than those with no rank or party membership (Zhao & Bourassa, 2003). This demonstrates that the delivery of affordable housing in Chinese cities is problematic since affordable housing often ends up in the hand of the unintended beneficiaries.

Similar to the problem of enforcing the qualifying criteria, the development standard of affordable housing in terms of built-up area has been an issue for the government to supply adequate housing to meet the housing needs of urban families. Housing developers are generally inclined to build affordable housing by raising the built-up areas and quality living space to attract the rich. The intended and targeted beneficiaries, on the other hand, are not able to buy an average affordable home as these houses became larger and more luxurious even though there is no increase in the price per square meter (Duda, Zhang, & Dong, 2005). This has resulted in the disparity between the stated objective and the actual outcomes of the affordable housing programs.

Furthermore, the supply of ECH declined significantly over the past few years. This could be due to the adjustment made by the government to control the land supply as well as the low profits of constructing affordable houses. These factors could dampen the housing developers' interest in participating in the affordable housing programs (Kou & Shu, 2007). Private property developers have been giving low priority to the affordable housing program, which fall below the targeted level. The proportion of affordable houses in total supply has never exceeded 25%. It only accounted for less than 10% of the total housing supply for the period of 2004 – 2006 (Niu, 2008). The share dropped even lower to less than 5% in 2007 (Deng et al., 2011). Another contributing factor to low supply of ECH is that most local governments are reluctant to support ECH program as they have to bear most of the subsidy cost (Deng et al., 2011).

### **Promoting Homeownership among Young Urban Households**

The Chinese government should look into sustainable ways to provide affordable housing to cater to the needs of young urban households. To ensure this noble measure gets off on the

right footing, it should be planned based on a long-term and holistic approach. Furthermore, there is a need for sustainable social housing policies that are capable of complementing the market-oriented housing market. If these sustainable policies are well planned and executed, the affordable housing will turn out to be among the best efforts in improving the quality of life and encouraging homeownership among low-income first-time homebuyers in China. Furthermore, these policies are able to stabilize housing prices by increasing supply on one hand and increasing social housing for the low income groups on the other (Lim, 1987).

### **Affordable Housing Financing**

Homeownership requires affordable financing (Quercia, McCarthy, & Wachter, 2003). In light of rising house prices in the urban areas, the government should make home financing more available and more affordable. This can be achieved by providing incentives in terms of lower minimum down payments and mortgage rates to first-time homebuyers who do not afford commodity housing in the market. Housing incentive is a central issue in the housing policy for the lower income group. The public housing policy in Singapore constitutes a good example. This policy prices the 3-room flat to the affordability level of 90% of Singaporean households (Tan, 2008). This substantial financial incentive represents a major commitment by the government, and is an important aspect of the Singapore housing policy to improve living condition of the lower income households.

Recently, the Chinese government has increasingly tightened controls on the housing market in an effort to rein in sky-high house prices. The government has introduced a series of tightening measures to cool the property market with the focus switching to existing homebuyers from the supply of new housing coming on the market. However, these tightening measures could prevent low-income first-time homebuyers from owning their own

homes. For example, first-time homebuyers in China are being hit with tightening measures such as higher minimum down payments and mortgage rates. As reported by Zhou (2011), Chinese banks have raised minimum down payments on first homes ranging from 30% to 40% and controlled home loan amounts. Furthermore, the banks have stopped offering discounts on mortgage loans for first-time homebuyers by raising mortgages rates for first home purchases by 5% to 10% above the benchmark lending rate. Chinese banks used to offer first homebuyers a 15% discount on the lowest mortgage rate.

Efforts are needed to make home financing more available and affordable by providing incentives to young urban households. Policies are developed to cheapen the cost of homeownership through financial assistance with down payment and mortgage interest payments. The Chinese government should consider the experience of the affordable housing scheme in Malaysia as an effort to improve housing affordability by supplying houses for first-time homebuyers. In the case of Malaysia, the government has recently announced My First Home Scheme which is targeted at first-time homebuyers earning RM 5,000 (1US = RM3) and less per month to acquire apartment units costing from RM 100,000 to RM 400,000 (Tan, 2013). This scheme also allows 100% financing for first-time homebuyers. The government subsequently launched the 1 Malaysia People's Housing Scheme (PR1MA) later. This scheme, which is an addition to the My First Home Scheme, will only focus on apartment units priced between RM 220,000 and RM 300,000 being built for first-time buyers with a household income of RM 6,000 per month. Under this scheme, eligible buyers can apply for a loan of up to 105% from financial institutions with a 30-year payment scheme. The extra 5% from the loan is to assist the homebuyers in paying for the cost of insurance and legal aspects of the purchase.



### **Housing Provident Fund (HPF)**

The government should make home financing more available and affordable by fully developing alternative home financing, such as Housing Provident Fund (HPF) to meet the housing needs of young urban households. As pointed by Tan (2008), the housing provident fund appears to be an important determinant of homeownership. Similar to the Employee Provident Fund (EPF) in Malaysia and Central Provident Fund (CPF) in Singapore, China's HPF is an obligatory housing saving program in which employers and employees both are required to contribute a certain percentage of employees' salaries to HPF accounts. As stipulated in the guideline for HPF, the minimum contribution ratio imposed by the central government is 5%. In addition to the withdrawal of HPF savings, employees can borrow low interest mortgage loans from HPF to finance home purchase, improvement, or construction. The interest rate is usually one percentage point lower than conventional loans due to the fact that there is a strong local government intervention in this type of mortgage.

Although Chinese households could withdraw HPF to buy, build, or improve their homes, the actual beneficiary pool is only a small number of employees. Since the HPF contribution is tied to salary, only employees with higher incomes receive larger contributions from their employers. In the case of low income employees, they receive either less or no contribution owing to the lower-end of the income distribution which may discourage them from applying for HPF loans. It is reasonable to believe that it has been difficult for low-income families to apply for HPF loans as the majority of them could not take advantage of HPF loans. According to Deng et al (2011), the ratio of loan beneficiaries is only 25% on the national level.

In order to increase HPF support to low-income families, the central and local governments should explore ways to increase the contribution from first-time homebuyers' employers. The central government has laid down the minimum requirement of 5%, but the contribution ratio is different from many cities. Some employees may not even receive 5% of their salaries in places other than Beijing or Shanghai (Deng et al., 2011).

Another contributor to low participation rate from employees is the approval process of HPF loans. As compare to conventional mortgages, HPF loans generally have the complicated procedure and stricter underlying criteria in getting approval from the HPF management centre of local government (Yang, 2010). In this case, the local government should liberalize and simplify the withdrawal process. As such, rules and regulations of HPF withdrawal, particularly documentations submitted for the application, need to be relaxed in order to enhance the efficiency of the withdrawal system. Also, a better HPF withdrawal information system is required to facilitate the approval process.

### **Affordable Housing Provision**

The rate of rural-urban migration for the past 30 years has caused the growing demand for affordable housing. However, housing developers in China are not keen to produce houses at prices which are affordable enough for homebuyers. It is partly due to the fact that the increased compliance and regulatory costs relate to the whole value chain of housing production (Mengjie et al., 2008). The central government is aiming to increase a record 36 million units of affordable housing in the coming years to cover 20% of China's housing market. However, most housing developers claim that their profit margins will shrink to a range of 3% to 8% down if they build affordable housing (The Star, 2011).

In order to achieve sustainable affordable housing provision, the local government should provide incentives in terms of preferential treatments to attract self-funded housing developer to undertake the ECH program. Furthermore, the government should look into ways to help ease the housing developers' burden caused by rising construction costs and land prices in urban areas. It is important for the local government to work together with housing developers to build affordable housing. Instead of leaving the responsibility to build these homes to housing developers, it should be a joint initiative between the local governments and housing developers. Since land matters in China fall under the jurisdiction of local governments, it is advisable that local governments provide and allocate enough parcels of land for the projects, while the developers provide their expertise.

Affordable housing provision requires a collaborative effort from different parties. As indicated earlier, local governments are generally not interested in supporting the program as these housing developments generate little fiscal revenue for them. In this case, the central government should explore ways to support the local governments who are actively involved in the provision of ECH. There is a need for the central government to provide preferential treatment to local governments for the production of ECH. These treatments come in the form of tax incentives, facilitation of funds, and development subsidies. These incentives could become another source of budgetary revenue for local governments. All the while, the local governments heavily depend on the land revenue from the auction. In this aspect, the local governments are more likely to commit to tightening policies to contain further house price increases if they are able to reduce dependence on land auctions as a crucial budgetary revenue source.

While pricing the property affordably is one the main objectives of the government, there should not be any compromise on the quality of affordable low-income houses. It is also vital to ensure that these houses are accessible to good public transportation facilities and are close to public amenities such as retailing centers, hospital and education facilities. This is because the lower income group is most dependent on these amenities to improve their standard of living. There is insufficient space within the city to house all urban dwellers. Therefore, it is important to plan and undertake well-connected residential housing development projects in the suburban areas to avoid the centralization of economic activities in the few core areas. This sustainable planning is needed in order to keep up with the rapid urbanization and rising housing needs of inhabitants. There is a need to have a well-integrated public transportation system to facilitate travel between the city suburbs and the city centre. As pointed by Tan (2012), affordable housing should be built and equipped with good amenities. Therefore, housing developers should develop areas near the public transport system for affordable housing in order to address rising house prices in urban areas so house prices in the city suburbs are not way above the affordability of young urban first-time homebuyers.

### **Stringent Enforcement of Housing Delivery System**

In addition to efforts by the government to promote homeownership among first-time homebuyers, the government has to be very careful to ensure that only the deserving first-time homebuyers benefit from affordable houses. China's housing reform policies have benefited some socially and economically advantaged groups. Nevertheless, it aggravates the economic polarization between the rich and the poor. The delivery of affordable housing has been susceptible to abuse as many people buying up several units for profit (Huang and Yi, 2011). Therefore, stringent enforcement of the regulation of qualifying households into the affordable housing program in terms of the eligibility and the development standard is needed

to prevent affordable houses ending up in the hands of homebuyers who want to make quick profits. Additionally, first-time homebuyers should not be allowed to sell their homes on the market for profit within the first few years in the hope that this type of housing only benefits homebuyers who need help for basic housing need. Furthermore, a detailed and comprehensive housing information system is needed in the country to allocate affordable housing and monitor its consumption. This system is crucial to prevent speculative buying among investors moving from one city to another.

The Chinese government should also enact strict laws and regulations for the real estate market. At present, China's legal system for real estate is inadequate and immature, and the government usually makes only temporary provisions such as regulations, notices, and government documents. The Chinese government needs to enact an appropriate legal system for the real estate market, and make full use of the market mechanism rather than administrative order to regulate the housing market.

## **Conclusion**

Homeownership is an important objective in the China's social and economic development programs. However, this objective is especially tough for Chinese households, whose income increases have in no way kept pace with house price inflation since 2005. The scale of house price appreciation has become a source of widespread popular discontent among homeowners. Despite efforts by the Chinese government, there are various issues relating to housing provisions that have undermined the success of housing achievement for urban families. Even though the Chinese government started the housing reform in the 1980s, they should now work tirelessly in various capacities towards improving the housing delivery system.

Property developers in China have been giving low priority to the affordable housing program, which falls below the targeted level. The construction of high-end housing, on the other hand, has contributed to the problem of double digit vacancy rates. In order to achieve sustainable housing provision, housing policies and programs should be economically viable, socially acceptable, and technically feasible (Choguill, 2008). Housing policies based on sustainability criteria – meeting basic housing needs – must be viewed as a necessity (Tan, 2011).

One way to address the housing needs of urban households in China is to increase the supply of basic and affordable housing units. It is important for China to raise the supply of ECH. Affordable housing is regarded as a public duty, not a commercial operation, and the government's housing policy is to sell homes to the people at prices they can afford. The sale of affordable housing needs to be expedited to ensure that those who are eligible will be provided houses that they can buy. In this regard, more stringent and appropriate policy guidelines of the sale of affordable housing must be drawn up to facilitate the implementation of the sale of affordable housing to urban families.

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