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The current issue is the third of the seventh volume of the *Athens Journal of Social Sciences* (AJSS), published by the **published by the [Social Sciences Division](#) of ATINER.**

Gregory T. Papanikos
President
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Children Self Reporting Abuse and Neglect in the U.S.: A Multi-year Analysis¹

By John E. Kesner* & Robert D. Latzman[±]

Child maltreatment represents a critical risk factor in the well-being of children around the world. There are a wide range of adverse outcomes associated with child maltreatment, both short and long term. Negative outcomes related to the child's physical and mental health as well as potential future psychiatric and criminal problems have been found. In the U.S. child protective services (CPS) are agencies whose sole mission is to both protect children and identify and hold accountable those who maltreat them. Each year, millions of reports of maltreatment are made to CPS. A fraction of these reports are made by the alleged victims of child maltreatment. The purpose of the current study was to describe reports made by the alleged victim of child maltreatment and to compare these reports to reports made by other adult reporters. More girls than boys made self-reports of alleged maltreatment to CPS. The average age of the self-reporter was older than the children involved in reports made by adult reporters. More African American and fewer White and Hispanic children self-reported alleged maltreatment compared to the other adult reporter groups. More self-reporters had a prior history of maltreatment compared to the other two adult reporter groups. Once CPS began the investigation, it took on average one day longer to make a finding for self-reports compared to reports made by mandated reporters. Results are discussed in terms of specific factors associated with self-reporters, public policy as well as cultural, racial and ethnic influences on the reporting of child maltreatment.

Keywords: *child welfare, self-report, child maltreatment, child protective services.*

Introduction

Child maltreatment is major risk factor for children's well-being in the United States and around the world. Child maltreatment is associated with a wide range of negative outcomes for both short-and long-term health, as well as psychiatric and criminal problems for the victim (Perry 2012, Felitti & Anda 2009, Messman-

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¹"The National Child Abuse and Neglect Data System (NCANDS) Child File data was provided by the National Data Archive on Child Abuse and Neglect at Cornell University, and have been used with permission. The data were originally collected under the auspices of the Children's Bureau, U.S. Department of Health and Human Services. The collector of the original data, the funder, NDACAN, Cornell University, and the agents or employees of these institutions bear no responsibility for the analyses or interpretations presented here. The information and opinions expressed reflect solely the opinions of the authors."

Morre et al. 2010, Gold et al. 2011). Additionally, it is also associated with more acute outcomes, such as death. In fact, child maltreatment is the second leading cause of death in children in the U.S. (Felzen 2002, Ballesteros et al. 2018). Child protective services (CPS) in the U.S. are agencies designed to both protect children and identify and hold accountable individuals who maltreat them. They form a myriad of systems organized largely by each state with a common goal of protecting children from harm. Each year, out of all the millions of reports CPS receives, a fraction of them are made by the alleged victims of child maltreatment. For example, in 2010, one-half of one percent of the 3.5 million reports were made by the alleged victim (U.S. Department of Health and Human Services 2011). This figure, while seemingly inconsequential in comparison to the totality of child maltreatment reporting in the U.S., represents reports from the children for which child protective services was designed. That makes these reports of critical importance.

Traditionally, research in to the reporting of child maltreatment has focused on adult reporters, while research on reports made by alleged child victims has been virtually ignored. The few studies that have been carried out on self-reporting of maltreatment have generally focused on sexual abuse. These studies were usually retrospective in design or focused on clinical evidence (Haapasalo and Moilanen 2004, Aalsma et al. 2002). Given the scope of the child maltreatment problem in the U.S. and that self-reports come from the very people this system was designed to protect; more research is needed in this area.

Children as Credible Sources

Whenever children are the source of information related to an alleged criminal act, determining the credibility of their report becomes more complicated and raises some critical issues. Many view the child victim/witness as psychologically vulnerable, potentially suffering from posttraumatic stress, depression, anxiety or at the very least, having trust issues (Patton 2010). This vulnerability calls into question the credibility of their report and creates a dilemma for CPS as it must both investigate the alleged child maltreatment and protect the psychological health of the child. This is further complicated when the primary source of information about the alleged maltreatment is also the alleged victim.

From a legal standpoint, the credibility of a witness to criminal activity focuses on their perceived honesty and cognitive ability (Nunez et al. 2011). The age of the child is also a factor which must be weighed in determining the credibility of their report of alleged maltreatment. A younger child may be perceived as more honest, but at the same time, less credible due to their limited cognitive abilities. Conversely, older children may be perceived as more credible due to more advanced cognitive abilities, but potentially more dishonest (Buck and Warren 2009, Nikonova and Ogloff 2005, Nunez et al. 2011, Ross et al. 2003).

Studies into the credibility of child witnesses have utilized hypothetical scenarios and vignettes, surveys of children's attitudes or have focused on cases already in the legal system. But, understanding how the credibility of self-reports of child maltreatment at the initial stages of CPS's screening affects the

investigation process is an essential first step. Before a maltreatment case reaches the courts, it must pass through several filters. The initial filter of CPS investigation is critical in determining if the report will be investigated. Examining extant reporting data from CPS agencies across the U.S. allows a glimpse into how CPS treats reports made by the alleged victim and whether there are systematic differences between these reports and those made by other adults.

Previous research has indicated that compared to reports made by adults, children's self-reports of maltreatment are less likely to be substantiated (Kesner 2007, Kesner et al. 2009). However, these studies were limited in scope, generally focusing on one year or two years of CPS data. Nonetheless, these studies raised important questions about how CPS views children's self-reported maltreatment. These limited analyses found differences related to the gender and race of the self-reporter and the substantiation rate of self-reports compared to reports by other adult reporters. It is essential to further examine these reports in more detail and for longer periods of time in order to observe trends in reporting practices.

Current Study

Using a population-based dataset, the purpose of this study was to describe reports made by the alleged child-victim of abuse and/or neglect and to compare these reports to those made by other adult reporters. Specifically, two research questions were addressed through data analysis. First, what demographic and other descriptive features distinguish child maltreatment reports made by the alleged victim? Specifically, the victim demographics, type of maltreatment alleged, whether the child was known to CPS from previous victimization and how often reports were substantiated. If the report was substantiated, reports were examined to determine the type of maltreatment substantiated and time taken by CPS to make a finding on the report. The second research question addressed how self-reports of maltreatment compared to other adult reporter groups on these same variables. The adult reporter group was broken down into two groups; reports made by adult professional reporters, adult non-professional reporters were compared to self-reports.

Method

Sample

The current study included population-based data from the National Child Abuse and Neglect Data System (NCANDS). Originally passed in 1974 and amended several times since, the Child Abuse and Prevention Treatment Act (CAPTA) required that the U.S. government establish a national database of child maltreatment reports. Each year states send data to NCANDS on the child maltreatment reports made to their respective child protective agencies (CPS). These data are then recoded and aggregated into a uniform database of child maltreatment reports from across the U.S.

The sample used in the current study included 21,027,392 reports of child maltreatment in NCANDS from 2005-2010. Data from all 50 states, the District of Columbia and Puerto Rico comprised the final dataset with the exception of North Dakota and Oregon. North Dakota only contributed to NCANDS in 2005 and 2010, while Oregon contributed only in 2006. Because of this, a multi-year analysis was not possible with these two states, therefore they were excluded. With the exception of these two states, these data represent the sum total of child maltreatment reports in the U.S. for these years. Thus, rather than analyze a sample of reports, this study examined the characteristics of self-reports of child maltreatment in the U.S. for the entire population of reports during the years specified.

Procedures

The three groups of reporters discussed previously were created using the coding provided in the NCANDS datasets. The self-reporter group was comprised of reports where the source was coded as "alleged victim". The professional group included any report with a source coded as "social services", "medical", "mental health", "legal", "law enforcement", or "criminal justice" or "education personnel". The non-professional group was any report with a source coded as "foster care provider", "parent", "other relative", "friends/neighbors", or "anonymous reporter". Reports made by these groups were first described and then compared to each other, first on the characteristics of the reports of alleged maltreatment (reports received by CPS and selected for investigation) and then, if substantiated, the characteristics of the confirmed case of maltreatment.

To address the research objectives, two profiles for self-reports of maltreatment were generated. The first profile was comprised of reports of alleged maltreatment, included demographic characteristics of the alleged victim/reporter (i.e., age, gender, race, and ethnicity²). Additionally, this profile included the type of maltreatment reported, prior victimization status, rates of substantiation, and the time taken by CPS to begin the investigation and make a decision on the report. A second profile detailing information on the same variable listed above, but only with substantiated cases of self-reported maltreatment (the rate of substantiation variable was not included in this profile). Characteristics of these two profiles were then compared to the other two reporter groups (mandated and non-professional adults) on the same variables.

As discussed previously, these data represent the population of reports made in the U.S. between the years of 2005-2010. Thus, traditional significance testing was not utilized. Rather than drawing inferences based on significance testing of a sample, we chose to analyze the entire population. A determination of statistical significance is not necessary when the "sample" is for all intents and purposes, the population (Cowger 1984).

²Consistent with the U.S. Census, NCANDS treats race and ethnicity as separate variables.

Results

Self-Reporter Profile for Alleged Maltreatment Reports

The average age of self-reporters was 12.6 years, with a majority of these reports coming from girls. Self-reports of alleged child maltreatment made by White children comprised the largest portion of this category (55%), followed by African American children (29%), American Indian or Alaska Native (1.7%), Asian (.8%) and Native Hawaiian (.2%) children respectively. Fifteen percent of these reports were made by Hispanic children.

Seventy percent of self-reports made during the study period were made by children reporting for the first time, leaving 30% of self-reports made by children with a prior history of abuse and/or neglect. To determine the time taken by CPS to investigate and make a finding, the number of days from the beginning date of the investigation and the date a finding was made (substantiated or not) was calculated. On average, it took CPS an average 4 days to investigate and make a determination about reports of child maltreatment made by the alleged victim.

Child maltreatment reports made to CPS may involve more than one type of maltreatment. While NCANDS data do indicate when more than one type of maltreatment was included in a single report, not all reports involve multiple types of maltreatment and due to a significant amount of missing data from NCANDS related to additional types of maltreatment, these analyses focused on only the first type of maltreatment reported.

The majority of cases of alleged maltreatment reported by the victim involved neglect (37%), followed by physical abuse (26%) and reports of alleged sexual abuse was involved in 8% of the reports. NCANDS does collect data related to reports of psychological abuse, but as nearly one-half of these data were missing, this type of maltreatment was left out of the self-reporter profiles. Eighteen percent of self-reports were, upon investigation, substantiated by CPS.

Profile for Self-Reporters (Substantiated Cases)

The average age of the self-reporter in substantiated cases was 12.3 years. As was found in the profile of alleged maltreatment self-reports, more reports made by girls were substantiated more often than reports made by boys. Once again, the majority of reports substantiated by CPS were made by White children (57%) followed by African American (24%), American Indian (2.2%), Asian (.8%) and Native Hawaiian (.3%) children respectively. Eighteen percent of substantiated cases involved Hispanic children. The majority of substantiated cases of maltreatment involved children who were not known to CPS (69%), leaving nearly one-third who were prior victims.

The majority of substantiated cases involved neglect (42%) then physical abuse (21%) and finally sexual abuse (15%). Missing data related to cases of psychological abuse did not allow it to be a part of the profile.

Comparisons on Reports of Alleged Maltreatment (3 Groups)

Comparisons among the three reporter groups were made with variables associated with reports of alleged and substantiated cases of child maltreatment. Profiles, utilizing variables identical to those used in the self-reporter profile, were created for the two other reporter groups and compared to the profiles of the self-reporter on their reports. These comparisons revealed several differences.

The number of girls involved in self-reporting of alleged maltreatment was greater than the number of girls involved in reports made by the other two adult reporting groups. Similarly, self-reporters, on average, were older than children involved in reports by the other adult reporter groups. More African American and fewer White and Hispanic children self-reported alleged maltreatment compared to the other two adult reporter groups. More self-reporters had a prior history of maltreatment compared to children in the other two adult reporter groups. It took CPS an average of one day longer to make a determination in self-reports compared to reports made by the professional/mandated reporter group (see Table 1).

Table 1. *Demographic Variables for Reports of Alleged Maltreatment from 3 Reporter Groups*

Reports of Alleged Maltreatment Variable	Self-Reporter	Mandated Reporters	Other Adult Reporters
Child Age	12.6	8.5	8.2
Child is Male	43%	49%	49%
Child is African American	29%	25%	23%
Child is Asian	.8%	1.5%	.8%
Child is American Indian	1.7%	1.8%	1.7%
Child is Native Hawaiian	.2%	.4%	.3%
Child is White	55%	57%	62%
Child is Hispanic	15%	21%	19%
Child is a Prior Victim	30%	26%	26%
Days: Investigation start to conclusion	4	3	4

Self-reporters alleged more physical and sexual abuse compared to the other reporter groups. They also reported less neglect than the other adult reporter groups. Self-reports were substantiated less often than those of mandated reporters, but at the same rate as other adult reporters (see Table 2).

Table 2. *Reports of Alleged Maltreatment by Type of Maltreatment*

Reports of Alleged Maltreatment Variables	Self-Reporters	Mandated Reporters	Other Adult Reporters
Physical Maltreatment Reported	26%	21%	16%
Neglect Reported	37%	45%	61%
Sexual Abuse Reported	8%	7%	5%
Maltreatment Report Substantiated	18%	31%	18%

Comparisons of Substantiated Cases

Similar differences were found in comparisons between the three reporter groups when examining substantiated cases of maltreatment. Once again, older children were involved in self-reports of maltreatment compared to the other reporter groups. However, while the average age of children in self-reports was relatively constant, the age of children involved in reports made by the non-professional and professional reporter groups was almost 4 years younger. Substantiated cases of maltreatment were reported by mostly female children as compared to the children in reports made by the other adult reporter groups. Fewer African American children self-reported substantiated cases of maltreatment compared to the children involved in cases reported by mandated reporters, but more than cases reported by other adult reporters. The percentage of White children who self-reported substantiated cases of maltreatment was the same as in cases reported by mandated reporters, but less than the number involved in cases reported by other adult reporters. As was found with reports of alleged maltreatment, fewer Hispanic children self-reported substantiated cases of maltreatment compared to the other two adult reporter groups (see Table 3).

Table 3. *Demographic Variables for Substantiated Cases of Maltreatment from 3 Reporter Groups*

Substantiated Cases of Maltreatment Variable	Self-Reporter	Mandated Reporters	Other Adult Reporters
Child Age	12.3	7.6	7.5
Child is Male	40%	49%	49%
Child is African American	24%	28%	23%
Child is Asian	.7%	1.4%	.9%
Child Is American Indian	2.2%	2%	1.8%
Child is Native Hawaiian	.3%	.5%	.3%
Child is White	57%	57%	62%
Child Is Hispanic	18%	22%	21%
Child is Prior Victim	31%	21%	29%
Days: Investigation start to conclusion	4	2	3

More self-reporters of substantiated cases had a prior history of maltreatment compared to cases reported by the other two adult reporter groups. When the report was substantiated, the number of days between the beginning of the

investigation and its conclusion again, was longest for self-reporters. At four days, the number of days for self-reporters was twice that of mandated reporters and one day more than other adult reporters. Substantiated cases of maltreatment reported by the victim involved physical abuse more often than other adult reporters and neglect less often than those of the other two adult reporter groups. The percentage of substantiated self-reported sexual abuse cases nearly doubled from the percentage of self-reports of alleged sexual abuse while the percentages for mandated reporters and other adult reporters remained about the same (see Table 4).

Table 4. *Substantiated Maltreatment Reports by Type of Maltreatment*

Substantiated Maltreatment Variables	Self-Reporters	Mandated Reporters	Other Adult Reporters
Physical Maltreatment	21%	26%	11%
Neglect	43%	56%	68%
Sexual Abuse	15%	8%	6%

Discussion

This population-based analysis of maltreatment reported by the alleged victim revealed critically important differences when compared to the reporting practices of other adult reporters. Given that children generally, are relatively powerless compared to adults (Bala et al. 2001), a child making a public accusation of abuse and/or neglect against a significant adult in their life is a significant event. However, the credibility of children as sources of information regarding these accusations is oftentimes suspect (Bala et al., 2001), and their reports may not be taken as seriously as the same report made by an adult. It is for these reasons, that a better understanding of self-reports of child maltreatment is critical

Results of the current study revealed that the self-reporter is more likely older and female, compared to children involved in reports by the other adult reporter groups. The findings that self-reporters are older than children involved in reports made by adult reporters is likely a reflection of the more advanced cognitive and verbal skills required for self-reporting maltreatment.

With regard to race and ethnicity, these results are generally consistent with previous research. For example, among reports of maltreatment by all reporter groups, African American children have been found to be overrepresented whereas Asian and White children are underrepresented when compared to their representation in the total population. Similarly, Hispanic children are slightly overrepresented in reports made by the two adult reporter groups. However, the proportion of Hispanic children self-reporting maltreatment was closer to their representation in the general population. These findings might suggest bias in the adult reporters in their reports of child maltreatment involving children of all races and ethnicities (over and underreporting respectively). The issue of reporter bias is irrelevant as the self-reporter and the alleged victim are one in the same. With the exception of Hispanic self-reporters, the overrepresentation and underrepresentation of certain racial groups in maltreatment reports suggests "visibility"

in the social welfare system may be a factor (Wulzcyn 2009). African American family are generally overrepresented in the social welfare system (Hill 2006), thus a greater percentage of African American self-reporters may have more direct access to resources which may facilitate a self-report of maltreatment. Similarly, families involved with social services may be under greater scrutiny from these agencies where child maltreatment may be identified. Conversely, Asians and Whites are generally more affluent and less "visible" to social welfare agencies. Self-reporters in these groups may have a more difficult time making a self-report due to their unfamiliarity with or lack of access to social service agencies. Some studies have supported the idea that socioeconomic status is a factor in representation in the social welfare system. Currently, Asian-Americans have the highest median income of any racial or ethnic group in the U.S. and a U.S. Bureau of the Census study found that the number of Asian Americans involved in maltreatment reports increased when income was controlled (U.S. Census Bureau 2012).

The impact of factors such as parental attitudes, cultural values, poverty and immigrant status have been documented in previous research on the reporting of child maltreatment (Ashton 2002, Freisthler et al. 2007). Although previous research has found variations in parenting practices and cultural norms regarding parental authority in both Hispanic and Asian children (Chao 2000, Ferrari 2002, Okagaki and Bingham 2005), little research has investigated the role of these factors in the rate of self-report of child maltreatment. For example, Dixon et al. (2008) found significantly higher levels of respect for parental authority in African American and Hispanic girls evidenced significantly higher respect for parental authority than White girls. Further, compared to White, African American and Hispanic mothers showed higher levels of restrictive parenting behaviors. Variations in childrearing and discipline in particular, cultural values emphasizing respect for elders and a culture that places particular emphasis on the connectedness of family relationships may make it more difficult for children to self-report child abuse and neglect by a family member or member of the community (Fontes 2002, Lau et al. 2006). This may explain why fewer Hispanic and Asian Americans self-reported when compared to the other two adult reporter groups. However, this reasoning falls short in terms of explaining the self-reporting rate among African American children. As reported earlier, African American children show a higher level of respect for parental authority, yet they tend to self-report more maltreatment than White children. Thus, respect for family and community, may not be as much of a factor in the decision to self-report. Clearly, there are other factors, yet unexplained, which contribute to the overrepresentation of African American children in reports by all reporter groups. It should also be noted that some believe that maltreatment in the U.S. is underreported (Giardino 2016). So, the self-reporting rate by all racial and ethnic groups may not reflect the actual incidence of child maltreatment. Issues such as respect for parental authority and a greater connectedness to the community may indeed be a factor in the decision of African American children to self-report. NCANDS data may reflect those cases where the maltreatment was so egregious that it brought them forward to report it.

In addition to important differences found with regard to demographic characteristics of self-reporters, the substantiation rate of self-reported child maltreatment was quite low when compared to adult mandated reporters, but similar to the rate for other adult reporters. This was not unexpected as children's self-reports of maltreatment have not traditionally been substantiated at higher rates (Everson et al. 2008, Swahn et al. 2006).

As discussed previously, this may be due to the relatively low credibility given by authorities to self-reports of maltreatment (Everson et al. 2008). Given their naturally egocentric nature, children may still be developing notions of fairness and justice and may not be able to accurately evaluate the behaviors of adult caretakers. What children perceive as abuse and or neglect, may not meet the technical definition of maltreatment as set by CPS (Bala et al. 2001). This is not to suggest that self-reports of child maltreatment should not be investigated with the same rigor as those made by adults. It should be noted however, that reports made by non-professional reporters had a substantiation rate similar to self-reporters. So, the issues of credibility of a report may not be limited to self-reports made by children.

The finding that self-reporters had more substantiated cases of physical abuse compared to the other adult reporters, but not professional adult reporters is somewhat confusing. Of all the forms of child maltreatment, physical abuse is the least ambiguous. Visible evidence of physical abuse can leave little doubt that it occurred. The other types of maltreatment, often vaguely defined, are more difficult to assess and oftentimes more difficult for children to understand. Kantor and colleagues (2004) found that even with adjusting the questioning, younger children were less likely to reliably report neglect when compared to older children. Given this, it could be expected that self-reporters would have the highest percentage of these cases. The immediacy of the physical evidence in self-reporters should make investigation by CPS much more efficient. It may be possible that professional adult reporters, by nature of their work are better at collecting evidence that would support the physical evidence of maltreatment. This is clearly an area for future research.

The slightly longer time needed by CPS to investigate and make a finding in self-reports of maltreatment may be the result of difficulties associated with the reporter's age and alleged victim status. The reporter group with the shortest investigation time was the mandated reporter group. This may be a reflection of the fact that mandated reporters are typically individuals who regularly come into contact with children and, in turn, are likely better equipped to observe and draw conclusions related to suspected child maltreatment. Traditionally this group of reporters has a higher substantiation rate than other non-professional reporters (U.S. Department of Health and Human Services 2011). Further, self-reporters were more likely to be prior victims of maltreatment when compared to children involved in reports made by the other two adult reporter groups. This suggests that children who are prior victims of maltreatment may be more familiar with the child protection system, making them more likely to report.

It is important to note that a slightly greater percentage of reports made by self-reporters involved sexual abuse compared to non-professional adult reporters.

This difference was much greater when looking at the percentage of substantiated cases involving sexual abuse involving self-reporters. The percentage of sexual abuse cases substantiated by CPS was almost twice the percentage for professional adult reporters and more than twice the percentage for other adult reporters. This suggests that efforts to bring sexual abuse to the forefront of public attention may be evidencing some success and that, at least with child sexual abuse, self-reports are being taken more seriously by CPS.

Limitations and Future Directions

First and foremost, NCANDS is an administrative dataset and is not ideally suited for research. Secondary analyses such as these reported here are limited by the variables used in the data collection system. Thus, the research questions which can be addressed are limited, as are the conclusions from any data analysis. The mapping process used by NCANDS to ensure uniformity of data across all states, although necessary for aggregating these data into a national dataset, may remove certain characteristics in each state's data. Additionally, due to variations in the maltreatment data each state collects and how these data are compiled, the issue of missing data further limits the national scope of NCANDS. Specifically, more detailed information about the victims, perpetrators, services provided and/or notifications to governmental agencies would help present a more complete picture of child maltreatment in the U.S. Finally, these results only reflect a certain period of time (2005-2010), thus the findings are limited in scope.

Future research should explore the differences found in this study to determine if they reflect real trends in the incidence of child maltreatment, child maltreatment reporting and the response by CPS. Preventing the incidence and reoccurrence of child maltreatment will only be successful with the cooperation of the public as well as the various public agencies associated with investigation. Further, the self-reporter of child maltreatment should be given equal consideration. As such, reports of maltreatment made by the alleged victim should be taken seriously by all concerned.

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Does Taiwan have a Gender Revolution? Assessment Based on Gender Role Attitude, Housework Division and Marriage Matching

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The second demographic transition theory believes that social values have undergone fundamental changes, less marriage and lower fertility have become the norm in postmodern society. However, from a family perspective, Taiwan does not have a "second demographic transition" (Yang et al. 2012). The traditional values of marriage and childbearing, two key factors of family formation, are still quite strong, echoing McDonald's (2000) Gender Equity theory. In addition, the "gender revolution" theory suggests that the past demographic transition is the first wave of the gender revolution, starting with women entering the male world (the job market). The future demographic transition will be the second wave of the gender revolution, with men gradually entering the world of women (housework). With the second wave of the gender revolution, marriage and fertility rates will gradually increase (Goldscheider et al. 2015). The purpose of this study is to explore whether Taiwan's marriage rate and fertility rate may rebound in the future as predicted by the gender revolution theory. Assessments based on gender role attitude, housework division, and marriage matching are employed. There are three main findings. First, the attitudes of gender roles are generally more egalitarian, but men's progress is slower than women's. Therefore, the egalitarian gap between men and women is greater than before. Second, among married couples, the husband puts more time into housework, but the wife still bears greater responsibility. Third, before the millennium, the proportion of men married to women with higher education levels than themselves increased, but with the expansion of higher education, the proportion of this marriage matching model gradually decreased. All of the above signs indicate that Taiwan has not yet embarked on the path of the second wave of gender revolution. The rebound in marriage and fertility rates in Taiwan is not optimistic.

Keywords: *Gender role attitude, Housework division, Marriage matching, Second gender revolution.*

Introduction

The past 30 years have brought great changes in the marriage and fertility behaviors of Taiwan. According to data from the Taiwan Ministry of the Interior, Dept. of Household Registration, from 1987 to 2017, the proportion of never married men in the 30-34 age cohort increased from 18.6% to 60.5% (Figure 1A); the proportion of never married women increased from 10.7% to 44.0% (Figure

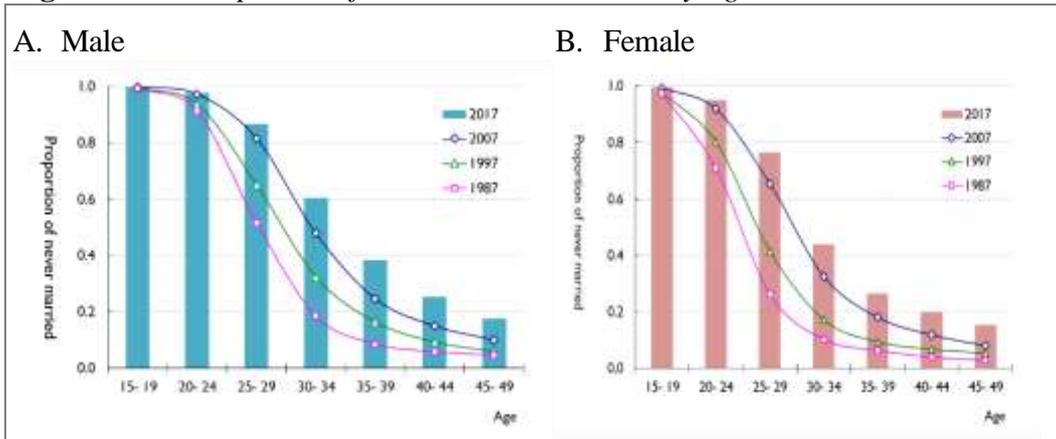
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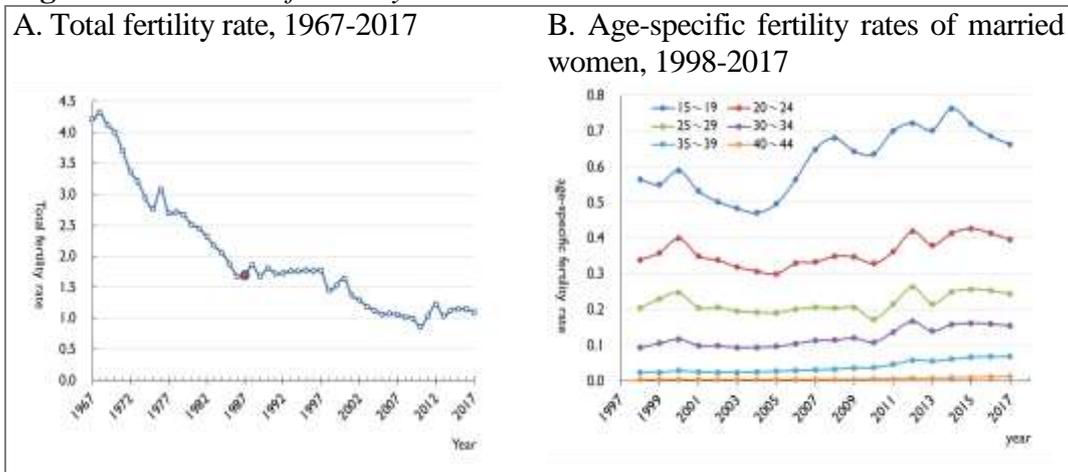
1B). In 2017, the average first marriage age for both genders is over 30 years old (males 34.5 years old, females 31.7 years old). As fertility is closely connected to marriage and non-marital births have never reached over 5%, there is a subsequent decrease in fertility rates. From 1987 to 2017, the total fertility rates decreased from 1.7 to 1.13 (Figure 2A); however, the fertility rates of married women showed no decrease (Figure 2B). Thus, the decrease in fertility rates is mainly due to the drop in marriage rates.

Figure 1. *The Proportion of Never Married Persons by Age, 1987-2017*



Source: Department of Household Registration, Ministry of Interior. <https://www.ris.gov.tw/app/portal/346>

Figure 2. *The Trend of Fertility Rates in Taiwan*



Note: Before 1998, the data of married women did not include foreign mothers, but the fertility rate included all birth regardless of mothers' nationality; thus the fertility rates of married women before 1998 is generally overestimated. The figure only lists the fertility rates of married women after 1998.

Source: Department of Household Registration, Ministry of Interior. <https://www.ris.gov.tw/app/portal/346>

Why do marriage rates decline? Is it because youth have no intention of marrying, or because they cannot get married? Cheng and Hsu (2019) utilize the data from the 2013 Survey on Women's Marriage, Fertility, and Employment, and

point out that over 90% of single women under 30 years old have the intention of getting married at some point. When women reach 40-44 years-old, only 40% remains anticipative to marriage. Contrasting to common belief, the women with higher education level also have a higher intention to marry. However, why are they still not getting married? Regardless of age and education level, about 60% of women feel that "they have not met someone suitable." Other reasons may vary according to their age cohort: for the 25 to 39 year-olds, it is due to financial issues; 40 to 49 year-olds, age issue. In other words, women still yearn for marriage, but rather stay single than marry someone who is not suitable.

Individuals in Taiwan remained single, yet cohabitation and non-marital birth rates have not increased. In 2010, the proportion of cohabitation in the 20 to 34 years-old age cohort is merely 4.0% (Yang 2013). Non-marital births have never reached over 5% (Taiwan Ministry of the Interior Dept. of Household Registration, 2018), and there is no fundamental change to the family structures. The majority of the families remained "traditional," that is, living with spouses, children, or parents; the proportion of non-traditional family structures (including single parent, skipped-generation, extended family, and living alone) is less than 16% (Yang et al. 2012). However, premarital sex behaviors have become more common. A longitudinal study focusing on fifth grade junior college students (about 20 years old) shows that in 1988, the proportions of men and women who had sex experience are 25.6% and 4.5% respectively; in 2007, the proportions increased to 30.9% and 28.7% respectively (Yen et al. 2009). The survey conducted in 2014 targeting students in higher education (about 18-22 years old) also reveals the proportion of men and women who had sex experience to be 45.7% and 34.2% respectively (Yen 2016).

On the factors influencing the decline of marriage rates and fertility, Family Economics (Becker 1973, 1974) suggest that with the rise of females' education level, participation in the workforce, and income, the gender roles are no longer definite; marriage may no longer maximize the persons' well-being and efficiency, which thus leads to the decline of marriage rates and fertility. Near the end of the 1980s, Europe not only experienced the decline of marriage rates, but also the transformation in family structure formation (through marriage, cohabitation, and birth) and dissolution (through divorce, separation, children leaving home, and death) mechanisms. Hence, the diversity of family structures has been highlighted.

Lesthaeghe (1991) and Van de Kaa (1987) propose the Second Demographic Transition (SDT) to emphasize the transition in familial values. SDT suggests that the familial value held in the past is the bourgeois family model, with the majority of people maintaining the traditional core value of family which emphasizes couple relationships and parenthood; the family model valued now is the individualistic family model which encourages people to look for individual lifestyle and personal identity, leading to more cohabitation, delayed childbearing, higher birthrate outside of marriage, and union disruption.

Although family economics stresses the transition of roles in marriage's exchange gain and SDT emphasizes the transition of belief in familial values, both theories predict similar futures: decreased marriage, decreased fertility, and unstable relationships. The prediction received support from numerous studies

(Lesthaeghe 2010); yet, Esping-Andersen and Billari (2015) state that many signs indicate there is little change in the familial values, but a gap exists between the ideal and reality. If the society can help spouse (or partners) maintain a balance between family and work, marriage (cohabitation) rates and fertility would increase. In other words, the transition of marriage and fertility rates comprises multiple equilibrium dynamics and is not necessarily a unidirectional and irrevocable decrement. Besides, Goldscheider et al. (2015) propose the theory of Gender Revolution, with the first wave of gender revolution being females entering the male world (workforce), the second wave of gender revolution being males entering the female world (the housework field). With the commencement of the second wave of the gender revolution, marriage rates and fertility will gradually increase; countries in Northern Europe can be seen as examples of the second wave of gender revolution. The trend may have also spread to other developed countries.

Taiwan seems to fit well with the scene depicted by SDT. However, no substantial increase in cohabitation or non-marital birth is observed after the drop in the marriage rate. There is no fundamental change to the family structures. Therefore, looking from the angle of families, Taiwan does not experience SDT; in terms of the two key factors of family, marriage and fertility, Taiwan seems to retain a firm traditional value. The current situation in Taiwan corresponds more to McDonald's (2000) Gender Equity Theory, which refers to the conflict in the pace of development between gender equity in individual-oriented social institutions and family-oriented social institutions.⁴

If Taiwan's marriage and fertility rates dropped rapidly because the development of gender equity in family-oriented social institutions lagged behind the development of gender equity in individual-oriented social institutions, what can be done to allow the development in family-oriented social institutions to catch up? The balance between work and family has always been the focal issue of policy response in countries attempting to cease the constant decrease in fertility. But the problem with the balance has always been set on females. The second wave of gender revolution theory provides the perspective of males entering the family, underscoring social policies that loosen the traditional gender roles and hierarchy. This study will introduce the theories of gender equity and gender revolution and discuss the potential and limitation of the second wave of gender revolution in Taiwan through the change in Taiwan's spousal housework division and trend in males marrying females with higher socio-economic status.

Literature Review

The second wave of gender revolution can be seen as the extension of McDonald's (2000) Gender Equity Theory; the following subsections will

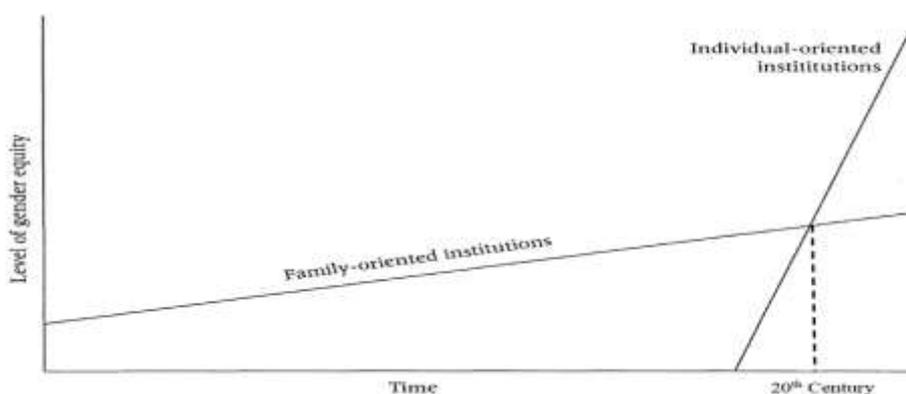
⁴Although McDonald (2000) mainly discussed the mechanism behind very low fertility, the theory is also appropriate for the discussion of the decline of marriage rates, as Taiwan has very low rates of non-marital birth, and the new decrease of fertility after 1997 is due to the decrease in the proportion of married couples.

elucidate the Gender Equity Theory and the Second Gender Revolution in detail.

Gender Equity Theory

McDonald (2000) divided gender equity into gender equity in individual-oriented institutions (e.g. access to vote, education, job market) and gender equity in family-oriented institutions (e.g. inheritance, fertility decisions, housework divisions). Figure 3 shows the transition trend of gender equity in individual-oriented institutions and in family-oriented institutions. Although gender equity in family-oriented institutions initiated earlier, it showed slow progress while gender equity in individual-oriented institutions started later but developed rapidly. The women's rights movement originated in the 18th century; however, only until the 20th century did the movement focus on women's suffrage, civil rights, and social rights. Though the women's rights movement has reached some success in education and employment in the earlier stages, women were still seen as the subordinates. After World War II, the gender gap rapidly narrowed in political, economic, and social aspects. On the other hand, gender equity in family-oriented institutions initiated earlier (e.g. monogamy and inheritance), but its development speed and effect are gradual. The invention of birth control pills in the 1960s is an important milestone which allows females to have autonomous fertility control. Yet, the effect of fertility control mainly facilitated the progress of females in employment and education, which enhances women's financial autonomy; fertility control did not emancipate women from traditional gender roles in the family (Brines 1993, Marini and Shelton 1993, Ishii-Kuntz 1994, Lee et al. 2000, Tsai 2004, Tang 2005, Lu and Yi 2005, Hsiao 2005, Chang and Li 2007, Chien and Yi 2012). Until today, most women are still the main caregiver of housework and childbearing (Altintas and Sullivan 2016).

Figure 3. Representation of the Progress of Gender Equity over Time



Source: Adapted from McDonald 2000: 435.

McDonald (2000) suggests that when the gap between the development of gender equity in individual-oriented institutions and in family-oriented institutions widens, there will be a greater drop in marriage rates and fertility. As women's development in individual-oriented institutions catches up to men, the imbalance

in the reward from employment and from home enlarges if there is only limited progress in the gender equity in family-oriented institutions and no adjustment in social institutions according to females' shift of roles. The imbalance brings a negative impact on marriage and fertility. To overturn the very low fertility rates, children's social value and the social responsibility to childbearing should be recognized. The public sector should promote measures such as equal pay for equal work, wages for housework, paternity leave to enhance the development of gender equity in family-oriented institutions. In other words, social policies can allow gender equity in family-oriented institutions to progress faster and be in balance with gender equity in individual-oriented institutions, which may cease the further decrement of fertility.

Ono's (2003) study focuses on Japan, the U.S., and Sweden, which represents high, mid, and low degrees of gender role differentiation. The findings show that women's higher levels of income encourage first marriage formation in the U.S. and Sweden, but discourage first marriage formation in Japan. The findings suggest that when society assumes the belief that men should engage in full-time labor market work and women should devote their time to housework, there will be more conflict between females' family and employment after they join the labor market. Japanese women may not have higher financial gain than American or Swedish women in employment, but face more loss in marriage because they will be expected to bear more family responsibilities. In addition, societies with high degrees of gender role differentiation mostly find non-marital births unacceptable, and thus fertility drops with the decrement of marriage rates.

A recent study shows that the socio-economic status (education level and income) of Japanese women demonstrate a positive correlation with marriage behavior (Fukuda 2013); since the 21st Century, Taiwan experiences the similar trend that women with higher education level demonstrate higher marriage behavior. However, this phenomenon is not because of the rise of marriage rates but echoes Korea (Park and Smits 2005) in the faster decline of marriage rates among females with lower socio-economic status (Cheng 2014).

Gender Revolution

McDonald (2000) stresses that the Gender Equity Theory is applied in cross-national comparison in below-replacement fertility countries, yet there may be data in the same timeframe with higher gender equity in family-oriented institutions but still low fertility. Hofferth and Goldscheider (2010) indicate that recent individual data in developed countries have shown rises in the marriage and childbearing rates of females with better socio-economic status; the stability of marriage is also enhanced (lower divorce rates). The phenomenon implies that gender equity in family-oriented institutions has started to catch up. Goldscheider et al. (2015) mentioned that the key to the development is the participation of men in housework and propose the theory of Gender Revolution, with the first wave of the revolution being women entering the world of men (labor market) and the second wave being men entering the world of women (housework).

In the first wave of the gender revolution, females (including mothers of young children) extensively entered the labor market, which was originally the male world. The women's entry into the labor market reduced the attractiveness of families; women were expected to bear more responsibilities in providing for the family but only received little emancipation from housework. For women, family and employment seems to be on two ends of the balance and can only pursue the success of one end. Also, family life faces more challenges after women enter the labor market and the potential for conflicts increased. For instance, should women leave the labor market after childbearing? Or should women return to the labor market after their children go to school? If the women leave the labor market, the family will have to deal with reduced financial resources; if the women return to the labor market, they will need to burn the candle at both ends to handle both work and family; if the women do not return to the labor market, they will need to cope with empty nest syndrome after their children leave home. These challenges or problems lead to conflicts and increase the probability of divorce. With the problem of extramarital affairs, men and women became more reluctant to the concept of marriage which implies a lifelong vow. Never married individuals, cohabitation, and nonmarital births have become common and formed the phenomenon described in SDT. However, was the transition elicited by the change in values (e.g. placing emphasis on individual recreation and consumption rather than parenting)? Or did women's entry into the labor market evoke the structural movement in gender relationships and both genders have not found a solution to satisfy the expectations of one and others?

The second wave of gender revolution refers to men entering the world of women (housework). Data have shown that there has been a constant increase in the frequency and time of males participating in housework, including childrearing and other ubiquitous housework, especially among youth with higher education levels (Aassve et al. 2015, Sullivan et al. 2014). However, the trend is only very recent. Why did the females' participation in the labor market rise rapidly in the 1960s, but males' participation in housework not increase until recently? Goldscheider et al. (2015) propose three possible reasons: (1) Traditionally, housework was more "unmanly" than employment was "unwomanly;" (2) Although the education for women was unintended for preparing them for employment, women's education initiated 100 years preceding their participation in employment. Women were more prepared to enter the labor market than men to enter the domestic world until the system of paid parental leave; (3) with the change in industry structures and labor market, the two incomes from both spouse have become an important strategy to maintain family finance; when women's employment and income is necessary for the family, women have more token to persuade men into sharing housework. With the two-income families becoming a norm, it is not odd for men to participate in housework.

Therefore, the Gender Revolution differs from SDT in that it suggests low marriage rates, low fertility, high union dissolution, and diversified family are not results from the transition of perceptions and values. They are changes elicited from the structural power shift of gender relationship changes. Firstly,

married women enter the public realm of the economy and become co-breadwinners; ultimately, men enter the private realm of the family to be co-nurturers. When the gender revolution enters the second phase, the turnabout of fertility and marriage stability is expected. The recent attitude on gender roles and the shift of males' participation in the housework are key components of the positive expectation. Research has shown that men with higher education levels tend to possess more awareness of gender equity, and devote more time in childrearing (Esping-Andersen 2009, García-Manglano et al. 2015); mothers with higher education level can cultivate mature daughters with higher gender equity awareness (Thornton and Young-DeMarco 2001) and sons can learn the concept of shared housework through the demonstration of their parents. In addition, when wives spend more time working, husbands spend more time on housework (Gershuny et al. 2005). The time men spend on childrearing is not influenced by the amount of time they spend working, but by their attitude on gender roles (McGill 2014). However, housework still mainly remained the responsibility of wives (Altintas and Sullivan 2016).

Summary

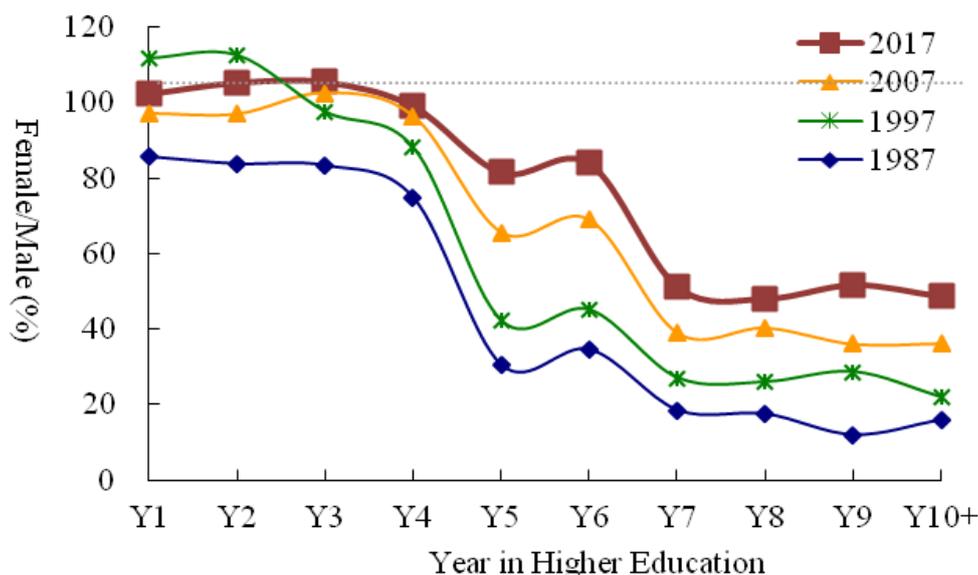
If unmarried individuals aspire to get married and bear children, the marriage rate and fertility rate can rebound. It is thus crucial to reduce the cost of marriage and childbearing. Males' participation in housework is one possible solution in reducing direct cost and opportunity cost. Once men participate in housework, there can be a more even division of housework, which reduces the stress of women in finding the balance between family and employment. When housework is for everyone and not only for women, it will be easier to enforce social policies that reduce the direct cost of childbearing and childrearing. The second wave of gender revolution addresses the possibility of men entering the family; in addition to the rebound of marriage rates and fertility rates, the theory implies the possibility of women becoming the sole breadwinner and men becoming the caregiver in the family. Housework is to be divided through specialization instead of gender division, which emancipates traditional gender roles and hierarchies. In other words, men can also have diversified life and career development like women in developed countries (Hakim 2003).

Taiwan's Development of the Second Gender Revolution: Opportunities and Limits

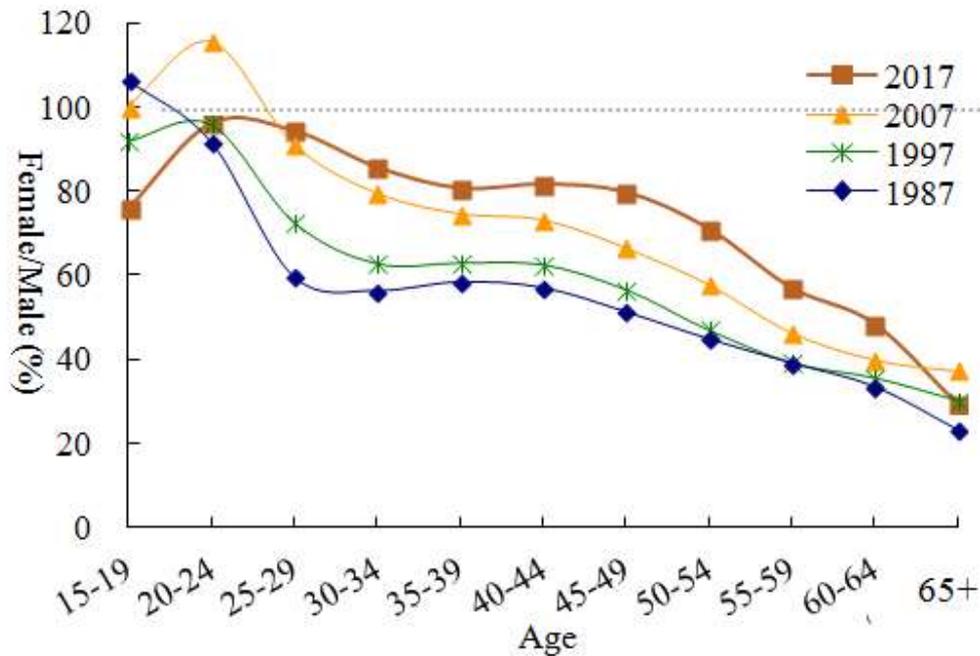
Taiwan's gender differences in the education level and the proportion of participation in the labor market in the past three decades are portrayed in Figure 4 and Figure 5. The vertical axis in Figure 4 is the ratio of the number of women in specific year of higher education divided by the number of men in the same year of higher education. The horizontal axis labels First year in university or college as Y1; Second year as Y2, and so on. Fifth-year in university and First year in Master's degree is combined as Y5; the Second year in Masters

as Y6. Third-year in Masters and First year in Ph.D. is combined as Y7. Those who studied more than four years in Ph.D. is labeled as Y10+. The figures reveal that Taiwan is still undergoing the first wave of gender revolution. The number of males and females in university or college has little differentiation; though there is still a gap between genders in graduate institutes, the numbers are steadily getting closer. The vertical axis in Figure 5 is the ratio of the age-specific labor force participation rate of women divided by the corresponding rate of men in the same age. The horizontal axis shows the age cohort by 5 years. As there is no differentiation in the access to university between genders, the previous phenomenon of higher labor participation rate of young women than that of men has diminished. In 2017, the age-specific labor participation rate of women under 50 years old has reached over 80% of the labor participation rate of men of the same age. The development trend can be seen as the prerequisite condition for cultivating the second wave of gender revolution. However, past research has shown that Taiwan does not demonstrate the phenomenon of SDT from the perspective of families. Therefore, to predict the development of Taiwan's second wave of the gender revolution, the perspective of family values is also fundamental.

Figure 4. *The Sex Ratio of Higher Education Students in Taiwan*



Source: Department of Statistics, Taiwan Ministry of Education. <https://depart.moe.edu.tw/ED4500/cp.aspx?n=1B58E0B736635285&>

Figure 5. The Sex Ratio of Age-Specific Labor Participation Rate in Taiwan

Source: National Statistics, Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Taiwan. <https://www.stat.gov.tw/ct.asp?xItem=32985&CtNode=4944&mp=4>

This study observes Taiwan's family value and potential of the second gender revolution from three aspects which reflects attitude, practice, and social support:

1. Gender differences in the attitude shift on gender roles: The society as a whole is expected to have a more tolerating attitude towards gender roles, but if males lag behind females on the shift of attitude, the gap between genders widens and can discourage family formation and persistence. If the gap diminishes gradually, it may spur the second wave of gender revolution.
2. The change in time and content of housework division: It is expected that there will be more men spending more time in housework, yet the proportion of men becoming the main caregiver of housework should rise to reverse the traditional gender roles in housework division.
3. The potential of men "marrying-up": In Taiwan, marriage is about two families and not only two individuals. The female's family of orientation with higher socioeconomic status may still prefer the marriage model of homogamy or female hypergamy. The resistance for women marrying men with lower socioeconomic status implies hindrances to gender equity. If the marriage model of men marrying-up increases, there may be more opportunities to spark the second wave of gender revolution.

Gender Role Attitude

Lu (2011) elucidates the changes in Taiwan's attitude toward gender roles comprehensively. Lu's study employs two items from the *Taiwan Social Change*

Survey as indicators: "When women have a full-time job, it always undermines their family life" (Female employment impacts on family), and "It is the responsibility of the husband to be the breadwinner, and the wife to be the caregiver" (Gender role segregation). Although Lu's study only discussed the change within the decade of 1991-2001, many findings still worth highlighting:

1. In the decade, there is a significant increase in egalitarian attitudes toward gender roles but only about half of the shift resulted from the change in attitude from individuals in the same cohort. Much of the transition resulted from the alternation of generations, which implies **the change in attitude towards traditional gender roles is only gradual.**
2. Men demonstrated more shift towards egalitarian attitude regarding the impact of women's employment on the family. In 2001, men even became more supportive of married women's employment than women. However, on the attitude towards gender role segregation, women's shift towards non-traditional attitudes doubled that of men. **The proportion of men shifting to non-traditional attitude towards gender role segregation in 2001 is lower than the proportion of women in 1991.**
3. Women with higher education, higher social status, or employment tend to possess unconventional attitude. Women with Christianity religious beliefs tend to be more traditional. This shows that women's gender role attitude is more in concord with group value, such as social status, employment, and religion. The formation of women's gender role attitude is the result of the subtle influence through organizations' or society's social norm and group values (symbolic interactive theory). The most predictive indicators of men's gender role attitude are the employment status of their spouse and number of children, which reflects that **men's attitude is shaped more by their life situations (exchange theory) and thus is less related to social collective ideology.**

In order to gain more understanding on the gender differentiation in Taiwan's changes on gender role attitudes, this study also employed similar items from the 2000 and 2012 *Taiwan Social Change Surveys*⁵ for discussion: "When women have a full-time job, it always undermines their family life" (Female Employment Impacts), and "Husbands as the breadwinners and wives as the caregivers enhance harmony in the family" (Family Harmony). Other than the differentiation in time cohorts, this study also examines the trend of change through the generations. With the history and social change of Taiwan, this study divides the population into four generations by birth cohort: 1927-1955, 1956-1967, 1968-1980, and 1980-1992.⁶

⁵The *Taiwan Social Change Survey* is a national survey adopting Probability Proportional to Size (PPS) Sampling. The 2002 survey collected 1,983 complete responses, with a corrected response rate of 62%. The 2012 survey collected 2,072 complete responses, with a corrected response rate of 60%. This study analyzed data of married individuals in the age range of 20-65 years old. The data comprised of a total of 2,113 responses; the 2002 survey data included 1,107 responses and 2012 data consisted of 1,006 responses.

⁶When these four generations reach the age of 18, the years are 1945-73, 1974-85, 1986-97, 1998-2010 respectively. The first generation experienced Taiwan after the war and grew up in a more distressed environment. The second generation had the 9 year compulsory education and entered the workforce during Taiwan's top economy growth. The third generation faced

Table 1. Change of Gender Role Attitude (by Period and Birth Cohort)

Period/Cohort Role	Period			Birth Cohort			
	1991	2002	2012	1927~55	1956~67	1968~80	1980~92
Gender Attitude							
Female Employment Impacts							
Male	2.60	3.46	3.53	2.89	2.96	3.48	3.69
Female	2.61	3.58	3.62	2.89	3.08	3.58	3.85
Gender Differentiation	0.01	0.12	0.09	0.00	0.12	0.10	0.16
Family Harmony							
Male	2.59	2.77	3.07	2.45	2.83	3.07	3.36
Female	2.79	3.08	3.36	2.53	3.16	3.46	3.78
Gender Differentiation	0.20	0.31	0.29	0.08	0.33	0.39	0.42

Source: Taiwan Social Change Surveys (1991, 2002, and 2012)

Notes: Each item is rated with a five-point ordinal variable, the lower the value means more tending towards the traditional value on gender roles.

Table 1 shows that both genders have become more egalitarian towards the view on "Female Employment Impacts." A more drastic increase can be seen in the third generation (1968~80); recently, the scores are above 3.5 regardless of gender (total score = 5, the higher the score means more egalitarian attitude towards gender role attitudes). The majority feel female employment does not bring discord to family life. But gender differentiation seems to have become greater. On the item of "Family Harmony" with the question "Husbands as the breadwinners and wives as the caregivers enhance harmony in the family," although the scores demonstrate the trend of becoming more egalitarian, the average scores are lower than the "Female Employment Impacts" item among the generations or genders. The trend in the score implies that the support for female employment is due to the needs in reality and not because of the change in values. What's more, it is observed that the younger the generation, a greater the gender differentiation on the attitude of "Family Harmony." As union formation is usually from individuals of the same generation, further exploration of the potential gap and conflict on the perception of gender equity between different genders is important.

Housework Division

In Taiwan, although husbands have increased their participation in housework with the increase of wives' employment (Lai and Huang 1996, Xu and Lai 2002, Hsiao 2005) and the traditional concept of gender role is no longer the mainstream belief (Lee et al. 2000, Tang 2003, Lu and Yi 2005, Lu 2003), there still exists

the shift and challenges of Taiwan's politics and society in their youth. When the fourth generation entered the labor market, they experienced the recession of Taiwan's economy.

a gap between men's belief and action (Mo and Wang 1996, Mo 1997, Wang 1996). Also, men's participation in housework is highly selective; they tend to choose more pleasing caring activities, such as playing with children (Wang 1996), or occasional "men's housework," such as easy house maintenance (Chang and Li 2007, Chien and Yi 2012)

Considering the time spent in housework, Tsuya and Bumpass (1998) examine husbands' share of housework by "dividing husband's average hour spent on housework per week by total hours of housework done by both spouses." Tsuya and Bumpass' study finds that Japanese husbands share about 7% of the housework, and American husbands 21%. Under the same evaluation method, Taiwan's data in 1996 show that Taiwanese husbands share about 20% of total housework (Tsai 2004). The percentage of husbands who share no housework was 10%, 43%, 25% in the U.S., Japan, and Taiwan respectively.⁷ Wives with full-time employment have significantly heavier burden; for instance, a wife with full-time employment has about 2.2 times total workload (sum of hours spent on housework and on employment) than a wife with no employment.

Comparing the differences in Taiwan's housework division of first-wed couples in the 1970s and 1990s, Lu and Yi (2005) observed four types of housework division: husband in charge, wife in charge, both spouses in charge, and others in charge. Lu and Yi's study shows that husbands in 1990s demonstrated a significant increase in their participation in housework than husbands in 1970s. Husbands' proportions of engaging in grocery shopping and cooking meals increased from 6.4% to 15.8%; doing dishes increased from 8.9% to 19.7%; household cleaning increased from 15.9% to 30.7%; buying daily commodities increased from 19.7% to 36%. But in both periods, housework is still mainly done by wives.

Analyzing the data from the 2002 and 2012 *Taiwan Social Change Survey*, with the focus on the change between "Husband in Charge" and "Both Spouses in Charge," Table 2 shows that although the proportion of "Husband in Charge" increased exponentially, the absolute value remained low. Until 2012, the proportion of husbands in charge of housework is merely close to 10%. If the division "Both Spouses in Charge" is added, there is more significant growth. However, with the division added, till 2012, only the housework of the more recreational "Buying Daily Commodities" has over half the proportion of husband or both spouses in charge; wives still take responsibility in more than 60% of other housework, such as grocery shopping, doing laundry, and household cleaning.

⁷The data for Japan is from 1994, the U.S. from 1988, Taiwan from 1996.

Table 2. Proportion Change in Housework Division between "Husband in Charge" and "Both Spouses in Charge"

Housework/ Year	Husband in Charge			Husband or Both Spouses in Charge		
	1991	2002	2012	1991	2002	2012
Buying Groceries and Cooking Meals	3.1	5.1	7.9	12.9	19.0	17.6
Doing the Laundry	2.8	7.1	10.2	12.0	22.9	25.8
Buying Daily Commodities	5.5	7.4	10.6	27.9	44.3	53.9
Childrearing	1.8	n.a.	n.a.	29.8	n.a.	n.a.
Household Cleaning	n.a.	6.2	9.5	n.a.	34.2	37.3

Source: Taiwan Social Change Surveys (1991, 2002, and 2012)

Notes: (1) n. a.: item unavailable in the year's survey; (2) Unit: %

Marriage Model of Men Marrying-Up

Homogamy and female hypergamy is the main marriage model in Taiwan (Tsai 1994, Tsay 1996). Yet, with the diminished differentiation of the education level or income between different genders, the space for the marriage model of female hypergamy is reduced. Therefore, three responses of assertive mating may arise: the increase of individuals never married, the increase in the proportion of homogamy, and the increase of exogamy of men marrying-up. The increase in individuals remaining single follows the previously stated trend. The recent changes in assortative marriage model are explored through three socioeconomic indicators: education level, age, and income. This study identifies the year (and not age) of women's first marriage, and divides the married women population into four groups of marriage cohort: 1970-1979, 1980-1989, 1990-2000, and 2000-2015. The data source is the *Survey on Women's Marriage, Fertility and Employment*⁸ from 1990, 1993, 2000, 2003, 2006, 2010, 2013, and 2016. The sample size analyzed included 75,819 couples.

The education level is categorized into 7 levels: "illiterate," "self-taught or elementary," "junior high school," "high school," "junior college," "university," and "graduate school." Each level is given the score 1 to 7 respectively. Men's education scores then subtracted women's scores. If the scores difference is 0, the marriage structure is seen as educational homogamy. As for the difference in age, this study directly subtracts wives' first marriage from husbands' first marriage age. The age differences are divided into 7 groups: "-10 years or more," "-9 to -5 years," "-4 to -1 year," "0 to 4 years," "5 to 9 years," "10 to 14 years," and "over 15 years." If the age difference is "0 to 4 years," the marriage structure is seen as age homogamy. For the variable of income, we categorized

⁸The sample population of the *Survey on Women's Marriage, Fertility and Employment* included all households in Taiwan. The survey adopted Probability Proportional to Size (PPS) Sampling. Females over 15 years old in the household are the target participants. The sample size of each survey is about 20,000 households.

the "monthly income" of those who are "currently employed" into 7 categories: "less than \$6,000," "\$6,000 to \$9,000," "\$10,000 to \$19,999" "\$20,000 to \$29,999," "\$30,000 to \$39,999," "\$40,000 to \$49,999," and "over \$50,000." The categories were given the score 2 to 8 respectively. At the same time, the score for women who are "currently unemployed" is 0; "unpaid homemakers" as 1. There are 9 income categories in total. The men's income scores then subtracted women's scores. If the scores difference is 0, the marriage structure is seen as income homogamy.

Table 3 categorizes the proportion of each indicators in the composition of the "men marrying-up" model. There is a significant increase in the marriage model of men marrying-up since the 1970s in any of the three indicators (education, age, or income). The increase is mainly due to the rise in the proportion of men marrying-up in terms of education levels, which has more than doubled since the 1970s. The proportion of men marrying-up in terms of age has shown some increase, but not as much as that of education levels. The proportion of men marrying-up in respect of income remained quite static. If two indicators were to be examined simultaneously, since the 1970s, the proportion of men marrying-up with any two indicators has increased from 1.47% to 4.77%. The marriage model with men marrying-up pertaining to two indicators is rare and has little possibility of breakthroughs. The proportion of men marrying-up with all three indicators is less than 0.1%, and is extremely rare. In sum, the marriage model of men marrying-up is not commonly accepted in the society, especially in terms of income, which shows stagnation in assortative mating.

Table 3. *Composition of the "Men Marrying-Up" Model at the Time of First Marriage*

Indicators (of Which Women Had Higher Level)/ Time of First Marriage	1970-1979	1980-1989	1990-1999	2000-2015
Single Indicator	16.35	20.93	23.25	25.10
Education Level	8.34	14.04	15.92	17.66
Age	6.61	6.60	7.86	9.25
Income	2.86	2.79	2.88	2.95
Dual Indicators	1.47	2.52	3.45	4.77
Education/Age	0.74	1.41	1.88	2.87
Education/Income	0.49	0.81	1.19	1.36
Income/Age	0.23	0.31	0.38	0.55
All Indicators	0.01	0.02	0.04	0.01

Source: *Survey on Women's Marriage, Fertility and Employment* (1990, 1993, 2000, 2003, 2006, 2010, 2013, and 2016). Notes: Unit: %

Conclusions

This study discusses the potential and limitations of Taiwan's onset on the second gender revolution through the shift in "gender role attitude," "housework division," and "marriage model of men marrying-up." The preliminary results show: (1) The society's gender role attitude has become more egalitarian in general, but men advance slower than women; there exists an increase in the gap of gender role attitudes between different genders, which implies possible family conflicts. (2) The time men spend on housework has gradually increased; yet, the absolute value of men becoming the one in the family who is in charge of the housework is still low, reaching 10% at the most. There is no sign of reversing traditional gender roles. (3) The model of downward marriage pertaining to women or "men marrying up" only exists in the aspect of education level; downward marriage pertaining to women in terms of income is an insurmountable barrier. In addition, after the millennium, downward marriage pertaining to women in the aspect of education level also decreased. In other words, though Taiwan's gender equity has developed to be more egalitarian, the phenomena of the support for women's employment, men's participation in housework, and the acceptance for downward marriage pertaining to women all seem to fit the description of multiple equilibria dynamics. Taiwan still has not embarked on the path towards the second wave of gender revolution.

Similar trends can be found in East Asian countries. Raymo et al. (2015) review the trend of family and marriage transition in Japan, Korea, Taiwan, and China. They suggest that although East Asian countries demonstrate similar socio-economic transition to Western countries, there has been little change in the essence and value of marriage and family, including: the strong bond between marriage and fertility (forbid extramarital birth and encourage birth as early as possible after marriage), the imbalance of gender roles after marriage, the demand on mothers' highly intensified time devotion, the firmness in status of homogamy and female hypergamy, and the tradition and support of multigenerational households. The anticipation of marrying and building families has also remained substantial; it is rare for unmarried individuals to decline marriage or fertility and most would wish for marriage and a family with two children (Atoh 2001, Retherford and Ogawa 2006, Yang and Rosenblatt 2007, Chang and Lee 2001). However, the direct cost (especially the cost of education) and opportunity cost (women's career development) of childrearing may be too high for the individuals to meet their expectation.

Though Taiwan has not commenced on the path predicted by the second wave of the gender revolution, the development implied by the Gender Revolution Theory is still a goal that is worthy of pursuing. In 2008, Taiwan's new Population Policy White Paper stated the expectation that "the total fertility rate will rebound back to 1.6 in 2015." However, there is no sign of a rebound in fertility rates, and the proportion of never married persons continues to increase. The contents of the white paper have dynamically adjusted until 2013 (Taiwan Ministry of the Interior 2013). The new practices for establishing childbirth-friendly environments included: providing financial support for childrearing families, enhancing

childcare service systems, improving maternity leave and childrearing leave without pay, enhancing childbirth health systems, increasing chances of marriage, and promoting the value of children as public goods. Yet, there are limited policy or practices on encouraging men to enter the household (e.g. paternal leave).

Till now, though women are more suppressed than men, society provides more support for women to develop their own stage in their career. While encouraging and accepting women's gradual enhancement and development in individual-oriented institutions, social recognition and expectation placed on men still remained in the success of their career. The traditional expectation neglects men's potential of entering the family and becoming excellent caregivers and is discouraging to the development of gender equity in family-oriented institutions. Besides, on the aspect of diversified life development, men are relatively in the minority. Thus, Hakim's (2003) concept of women's lifestyle patterns may become a reference to encourage and accept men's development of diversified life goals.

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Relating Parenting Styles to Adult Emotional Intelligence: A Retrospective Study

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Parenting style is a known associate to many aspects of emotion socialization, knowledge, and self-understanding. However, there is little empirical research comparing parenting styles to emotional intelligence overall. To evaluate the link between parenting style and current emotional intelligence, the present study asked psychology undergraduates to complete a retrospective measure of their parents' childrearing behaviours (coded as authoritative, authoritarian, permissive, and neglecting) plus a measure of their current emotional intelligence. It was hypothesized that authoritative parenting would relate to highest emotional intelligence levels, permissive parenting and authoritarian parenting to low emotional intelligence levels, and neglecting parenting to the lowest emotional intelligence levels. Results showed that emotional intelligence was higher for those raised authoritatively and permissively than for those raised by authoritarian or neglecting parenting styles, indicating that the responsiveness and levels of support characteristic of these styles have the strongest positive relation to adult emotional intelligence. The implications of the present findings, as well as the directions for future research, are discussed.

Keywords: *demandingness, emotional intelligence, emotion, parenting style, responsiveness.*

Literature Review

Following Adler's (1924) original theory outlining the impact of parenting style on adult personality, subsequent research across the decades has shown significant links to such constructs as wellness in life, self-control, self-esteem, and relationship satisfaction (see Darling and Steinberg 1993, Erikson 1959, Mahasneh et al. 2018, Sutcliff 2014, Turpyn et al. 2015). The present study examined the link between parenting style and emotional intelligence (Goleman 1995) in a retrospective study of university students.

Parenting Style

Since Baumrind's (1966, 1989, 1991) original conceptualization, parenting style (Ausubel 1954, Betts et al. 2009, Maccoby and Martin 1983, Maddahi et al. 2012) has been characterized as the combined dimensions of parental reinforcement (i.e., love and support, known commonly as *responsiveness*); and the number, volume, and type of demands imposed (i.e., rules and regulations placed on the

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child, known commonly as *demandingness*). To be clear, demandingness can be negative or positive (Alegre 2011), wherein negative demandingness includes psychological manipulation and inconsistent or excessive discipline, whereas positive demandingness involves: more egalitarian methods of authority, offering rationale for parenting decisions, providing autonomy, and holding appropriate expectations (Baumrind 1989). By crossing parents' levels of responsiveness with levels of demandingness, this renders a four-cell configuration. Specifically, *Authoritative Parents* place high positive demands on children, while providing consistent reinforcement in the form of affection and support. *Authoritarian Parents* alternatively are high in negative demands with little or no positive reinforcement. *Permissive Parents* show little demandingness but are highly responsive; and *Neglectful Parents* demand little from their children but similarly provide them little or no attention and support (Bednar and Fisher 2003, Sullivan et al. 2010).

In past decades, substantial research has examined how parenting style predicts children's outcomes in later life. For example, authoritative parenting style has been associated with positive self-concept (Lee et al. 2006), less relational aggression (Kawabata et al. 2011, Sutcliffe 2014), fewer symptoms of anxiety, depression, and stress (Betts et al. 2009, Lee et al. 2013, Wagner et al. 1996), fewer internalizing behaviours leading to maladaptive eating in children and adolescents (Salafia et al. 2007), and finally academic procrastination and misbehaviour (Diaconu-Gherasim and Mairean 2016, Mahasneh et al. 2018, Xu et al. 2018, Zabihollahi 2013). Research has found similar, albeit indirect, results when examining samples from more diverse contexts such as race, culture, and income (Amato and Fowler 2004, Lee et al. 2013, Maddahi et al. 2012, Rudy and Grusec 2006, Shumow et al. 1998).

Emotional Intelligence

Although not the first to coin the term, Goleman (1995) was instrumental in popularizing the construct of emotional intelligence. With little discrepancy found in relational or occupational outcomes between individuals with high vs. low IQ, Goleman (1995) believed these differences could be explained by personality characteristics such as determination, self-control, and motivation – so labelled "emotional intelligence." Since then, other researchers have added different categories. Mayer et al. (2008) considered emotional intelligence as the *ability* to not merely reason about emotions but to also use emotions as a factor in rational thought. They identified three different perspectives by which to view emotional intelligence: (1) the "specific ability" approach places in direct focus one's ability to use emotions to achieve different skills, such as perceiving the emotions of others (e.g., emotional input in thought and management of emotion); (2) the integrative model approach converts an overall measurement of several specific emotional skills into an overall emotional intelligence value; and finally (3) the mixed model approach includes other factors that are not typically placed under emotional intelligence, but rather incorporates related traits (Mayer et al. 2008). Petrides and Furnham (2001) focused instead on the distinction between emotional

intelligence as either a trait or ability. Trait-based emotional intelligence is often measured in personality (chiefly self-report) studies, and focuses on dispositional dimensions; in contrast, ability-based emotional intelligence is typically measured through performance tests, and relates to specific cognitive abilities. Salovey and Mayer (1990) previously introduced a separate (ability-based) definition of emotional intelligence, reflecting one's ability (a) to perceive emotions in oneself and others, (b) to use emotions to help with thought, and (c) to understand emotions and regulate them to promote personal growth. The authors proposed a hierarchical model of emotional intelligence development, from basic perception of emotions to the more complex regulation of emotions. Most researchers have reached the consensus that both trait and ability models are useful in conceptualizing emotional intelligence (Schutte et al. 2011).

Subsequent research has shown the significant impact of emotional intelligence when applied to relationships (Lopes et al. 2004, Lopes et al. 2003), education (Ferrando et al. 2011, Maynard 2003, Rivers et al. 2012), health outcomes (Turpyn et al. 2015), and the workplace (Jung and Yoon 2012, Kotzé and Venter 2011). Furthermore, emotional intelligence has been studied in the context of teamwork, job performance, and job satisfaction (Carmeli 2003, Chien et al. 2012, Lee and Ok 2012). This may be attributed to the tendency for individuals with high emotional intelligence to have lower turnover rates and more effective organizational commitment. Satisfaction may increase also because of lower levels of negative feelings or through superior work conduct.

Finally, research has shown positive personal outcomes for individuals with high emotional intelligence such as subjective and psychological well-being (Burrus et al. 2012), greater cooperation, and fewer externalizing and internalizing behaviours in later childhood (Izard et al. 2001). Studies indicate that individuals who have developed emotional intelligence also display a more positive affect (Fernández-Berrocal and Extremera 2016). Moreover, emotional intelligence has also been negatively correlated with maladaptive behaviours, such as alcohol consumption (Schutte et al. 2011) and regular smoking habits among young adults (Hill and Maggi 2011). Potential benefits have also been implicated in clinical therapy settings due to improved receptiveness to the training (Zeidner et al. 2008).

Parenting Style and Emotional Intelligence

Emotional socialization research has shown the family to be the initial learning centre for children, recognising that parents significantly impact their children's social and emotional development (Salovey and Sluyter 1997). It is therefore plausible to further assume that parenting style plays a significant role in the development of children's emotional intelligence. Research in this area remains fairly limited. Alegre (2012) examined the link between mothers' parenting style and her children's emotional intelligence, but uncovered no significant results. In contrast, Karim et al. (2013) explored the emotional regulation of over 200 children given a particular parenting style, and found a more adaptive regulation in children raised in an authoritative style, but the reverse for children raised in an authoritarian style.

Present Study and Hypotheses

This retrospective study evaluated the relation between perceived parenting behaviours (typified by the four styles) and emotional intelligence. These findings will augment the current literature from a new perspective, specifically that of adults responding retrospectively about both of their parents' behaviours and child-rearing styles. This should provide insight into the more long-term effects of parenting style, while offering empirical support for its relation to emotional intelligence. The model of ability-based emotional intelligence was used presently to focus on the critical emotional skills attained the parenting style that respondents remember. The central hypothesis investigated whether differences in emotional intelligence could be predicted from unique parenting styles; however, additional hypotheses were offered:

Hypothesis 1. *Authoritative* parenting behaviours (High Responsiveness + High Demandingness) would correspond to the highest levels of all measured components of emotional intelligence (viz. emotion recognition in self and others, emotion regulation in self and others, and use of emotions for thought).

Hypothesis 2. *Authoritarian* parenting behaviours (Low Responsiveness + High Demandingness) would correspond to low levels of all components of emotional intelligence.

Hypothesis 3. *Permissive* parenting behaviours (High Responsiveness + Low Demandingness) would correspond to levels of all components of emotional intelligence, situated between those of authoritative and authoritarian styles. No research to date has specifically examined permissive parenting behaviours, and research on responsiveness and demandingness affecting emotional intelligence remains mixed. High responsiveness behaviours are associated with higher understanding of emotions (Dunn and Brown 1994) and emotion knowledge (Bennett et al. 2005). Parental monitoring is an aspect of positive demandingness, relating to high levels of general emotional intelligence (Liau et al. 2003); and it is possible that the lack of positive demands made on children with permissive parents negates the benefits of responsiveness provided.

Hypothesis 4. Finally, *Neglectful* parenting behaviours (Low Responsiveness + Low Demandingness) would correspond to the lowest levels of emotional intelligence on all components.

Method

Participants

The sample consisted of 85 undergraduate students (91% female) from a mid-sized university. Participant ages ranged from 16 to 39 years with a median age of 20. The ethnic background of participants was 68% Caucasian, 11% African-American, 6% Middle Eastern, 2% East Asian, and 1% Latino (12% other). All

participants were taking at least one university psychology course enrolled in the psychology participant pool; compensation was offered as partial credit towards their eligible psychology course.

Measures and Procedure

In addition to age and sex, the *demographics questionnaire* asked whether (and how long) participants currently live with parents, whether they grew up with a single parent, both parents, or shared custody; and whether they had children of their own.

The 30-item *Parental Behaviour Questionnaire* (PBQ; Wissink et al. 2006) assessed the frequency of specific parental behaviours. Six paired subscales were assessed: warmth and responsiveness (responsiveness), strictness and discipline (negative demandingness), and explaining and autonomy granting (positive demandingness). Participants responded using a 5-point Likert scale format, ranging from 1= "never" to 5= "very often." Analysis of the three major subscales showed high internal consistency: Responsiveness ($\alpha = .93$), Positive Demandingness ($\alpha = .86$), and Negative Demandingness ($\alpha = .91$). Whereas the original scale was written for adolescents, items were adapted to suit an audience of young to middle adult years, answering retrospectively about their childhood for the purposes of the present study. Baumrind (1991) found high consistency between mothers and fathers raising children together; the scale was adapted for responses, averaging the frequency of behaviours displayed by both parents.

Finally, the 10-item *Brief Emotional Intelligence Scale* (BEIS-10; Davies et al. 2010) assessed behaviours related to participants' emotions. As a concise version of the Emotional Intelligence Scale (EIS; Schutte et al. 1998), the BEIS-10 consists of five subscales: recognition of one's own emotions, recognition of others' emotions, regulation of one's own emotions, regulation of others' emotions, and utilization of emotions (Salovey and Mayer 1990). With a 5-point scale (1= "strongly disagree" to 5= "strongly agree"), the overall scale demonstrated high reliability ($\alpha = .86$).

After providing informed consent, participants completed the questionnaire comprised of two scales and a separate pencil-paper demographics questionnaire (in randomized order); all other responses were recorded using computer scoring sheets, taking under thirty minutes.

Results

Subscale scores of support, and both positive and negative demandingness were calculated; scores above the median were classified as high, and scores on or below were classified as low. Participants scoring high on both positive demandingness and support were coded as Authoritative ($n = 25$); high negative demandingness with low support was coded as Authoritarian ($n = 22$); high support with low demandingness was coded as Permissive ($n = 15$); and low support and demandingness were coded as Neglectful ($n = 16$). Data from 7 participants, who

fell into none of these categories, were excluded (overall $N=78$).

Means and standard deviations are found in Table 1. With significance set at .05 for all tests, an analysis of variance revealed significant differences in overall emotional intelligence by group, $F(3, 74)=10.40, p<.001$. Student-Newman-Keuls post-hoc comparison tests showed no significant difference in overall emotional intelligence between Neglecting and Authoritarian parenting ($p>.05$), and no significant difference between Authoritative and Permissive parenting. There was, however, a significant difference between parenting styles with high and low levels of responsiveness. Participants who believed their parents were highly responsive – either Permissive or Authoritative in style – had higher overall emotional intelligence levels than participants who believed their parents were less responsive – either Authoritarian or Neglecting in style ($p<.05$).

There were also significant differences by group for both regulation of other's emotions, $F(3, 74)=42.34, p<.001$; and use of emotions, $F(3, 74)=24.39, p<.001$; both not for the following variables: recognition of one's own emotions, recognition of other's emotions, and regulation of one's own emotions ($p>.05$). Student-Neuman-Keuls multiple comparison procedures revealed the same pattern as with overall emotional intelligence, namely that Neglecting and Authoritarian styles (though not different from each other) had significantly lower levels of both regulation and use of emotion than the Permissive and Authoritative styles (which were not significantly different from each other).

Table 1. Means (Standard Deviations) of Emotional Intelligence by Parenting Style ($N=78$)

BEIS-10 SCALES	Authoritative	Authoritarian	Permissive	Neglecting
Recognition of own emotions	7.36 _a (2.08)	7.50 _a (1.44)	7.80 _a (1.37)	7.00 _a (1.67)
Recognition of others' emotions	7.44 _a (2.26)	8.00 _a (1.41)	7.80 _a (1.42)	7.40 _a (2.13)
Regulation of own emotions	7.20 _a (2.40)	7.80 _a (1.52)	7.87 _a (1.47)	7.25 _a (1.88)
Regulation of other' emotions *	8.60 _a (1.80)	3.72 _b (1.52)	7.80 _a (1.47)	5.00 _b (1.59)
Use of emotion *	8.70 _a (1.50)	5.59 _b (1.47)	8.00 _a (1.56)	5.06 _b (1.95)
Emotional Intelligence (Total) *	39.24 _a (7.06)	32.64 _b (4.32)	39.27 _a (4.50)	31.69 _b (5.31)

Note. * Significant ANOVA ($p < .05$)

Means with identical subscripts are not significantly different ($p > .05$)

Discussion

The central hypothesis in the present study was supported, based on significant differences in emotional intelligence by style. Contrary to hypotheses that parenting style would uniformly relate to all components of emotional intelligence, there was no significant difference by parenting style on the emotional intelligence subcomponents of recognition of one's own or others' emotions, and regulation of one's own emotions. More research is needed to

sufficiently explain the lack of relation between these factors, though it may have resulted from the lower sample size. In addition, whereas secondary hypotheses predicted parenting styles to relate to emotional intelligence scores in a linear hierarchical fashion, results indicated a polarized model along the spectrum of responsiveness. Authoritative and permissive parenting – both highly responsiveness styles – were related to higher scores in regulation of others' emotions, use of emotions for thought, and overall emotional intelligence. That the two responsive styles were not different from each other is meaningful, since parents who are engaging, supportive, and warm in their approach should likely observe their child exhibit strong levels of emotional intelligence. Conversely, the styles characterized by low responsiveness further confirm these findings. That is, participants reporting being raised under either an Authoritarian or Neglecting parental style had lower emotional intelligence scores on two of the three components, as well as overall emotional intelligence. The absence of differences between these two unresponsive styles indicates that placing harsh demands on children without offering support is associated with lower emotional intelligence scores.

The current results match well with the findings of (a) Betts et al. (2009), who found increased risk of depressive symptomatology among adolescents raised with low nurturance and high overprotection; and Karim et al. (2013), who reported emotional regulation was highest for youth raised by authoritative parents and lowest when raised by authoritarian parents. Conversely, the present results differ somewhat from Alegre (2012), who found no relation between mothers' self-reported parenting style and children's emotional intelligence, though this appears (in the wider theoretical landscape) to be anomalous. In the current retrospective study, participants were asked to provide their memory of their parents' child-rearing behaviours, representing a measure of perceived parenting; rather than soliciting a parenting inventory directly from the parents. It is possible that parenting in the current study was reported with less bias than the mothers' self-reports in Alegre's (2012) study. This would also explain the surprisingly high number of participants reporting a frequency of parental behaviours low enough that qualified as 'neglecting.' Uniquely, the current study examined the style presented by both parents, rather than simply the mother's parenting style. Likely the interaction of both parents' styles better predicts emotional intelligence than what could be garnered from a solitary parent (Alegre 2012). To date, no research has examined the specific interaction of mother, father, and child with regards to the child's emotional outcomes, but the current results suggest that avenue should prove fruitful.

The present study is not without its limitations, beginning with a lack measurement variance in each of ethnicity, age, and gender within the sample. With a university student sample, it is assumed that social class and household income are also of limited range. Thus, the relative heterogeneity of the sample impedes the generalizability of findings. Due to the constraints of the available pool of participants, the sample size was also not especially large and contributed to the lack of significant difference along some measures. The use of retrospective scales to assess parenting style harbours its own limits. Some research has shown

that adolescent perceptions of their parents' style is at times inaccurate (Smetana 1995). However, in the case of participants no longer living at home, a respondent's memory for parental behaviours may be poor or even altered over time. The parent-child relationship itself is liable to change with time and skew one's recollection of past parental behaviour. In any case, it is important to keep in mind that the present results are based on the participants' perception of parenting styles displayed in their childhood, and not necessarily true parenting styles. Additionally, the administration of all measures was carefully executed in an effort to eliminate socially-desirable responding, however it remains possible that emotional intelligence scores may carry some inaccuracies due to respondent bias. The present study also fails to take into account the various contextual factors known to affect parenting. Distal factors such as neighborhood poverty and available social services have been found to affect the type of parenting behaviours displayed, as well as family factors such as children's difficult behaviour, parent's education, and mothers' ages (Pinderhughes et al. 2001). In future, research on the link between parenting and emotional intelligence would do well to consider parenting behaviours within various relevant contexts.

With the acknowledgement of these limitations, it is important to note that the present research offers several significant contributions to the emotional intelligence literature, the first of which is the potential of optimal parenting style to encourage positive emotional intelligence outcomes. As the majority of homes become dual-income and the line between work and home life blurs, it may result that in trying to meet basic needs today's parents increasingly lack the time or energy to communicate effectively with their children. Our recommendation then would be a parent's increase in both the amount of warmth and affection displayed and the frequency of responsive behaviours (e.g., asking about a child's feelings or recognizing when the child is upset and offering to listen) should help shift a parent from a neglecting (harmful) style to at least a permissive parenting style. Furthermore, despite the common use of adult samples in emotional intelligence research, parenting perceptions are more often gathered from adolescent samples. Thus, the current study offers confirmatory results within an under-explored domain – that of adults' perceptions of their parents' child-rearing behaviours. On that same note, the present study is unique in its examination of parenting of both mother and father. Thus, results in the current can expand the research literature beyond what was typically focussed on the mother's parenting style. Results also greatly contribute to the literature surrounding emotional intelligence. Although not the first to identify a relation between parenting style and emotional intelligence (Alegre 2011, 2012), and although causation cannot be determined, these results call attention to a relation between two constructs that are empirically entwined.

Implications should be stated as means to improve child-rearing outcomes. Intervention and education programs for parents should focus on behaviours to enhance parental responsiveness to children for most the effective results, especially concerning both the ways and means toward regulating the emotions of others. The present results indicated that responsiveness was significantly related to the regulation of others' emotions, the use of emotion for thought, and overall

emotional intelligence. The same results were not however found for demandingness. Thus, parenting styles high in responsiveness (regardless of discipline level) would offer the best outcome for adult emotional intelligence.

Future research would benefit in the analysis of confounding factors that may influence the parenting style-emotional intelligence relationship such as age, gender, education level. So too, whereas the present study utilized an ability-based approach to emotional intelligence, and equivocal argument could be made that a trait-based approach is a legitimate means to evaluate the hypothesis. As such, the concept of how to both define and measure emotional intelligence – as it relates to the empirical testing of hypotheses – remains a contested matter. Finally, it would be worthwhile to explore how different combinations of parenting styles in two-parent homes (e.g., a permissive mother with an authoritarian father) relate to emotional intelligence

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A Clay Army: Acid Attacks in Europe

By Ada Prisco*

Europe of ancient culture, a forge of religious traditions, proud of its Christian roots, the cradle of refined philosophies, presents widespread symptoms of gender-based violence. Here it is reflected on the attacks with the acid mostly on women's faces. These gestures cannot be dismissed as import attacks that are extraneous to Europe in substance. Their alarming increase challenges all branches of knowledge and highlights distrust towards the woman and her way of relating to life outside the home. This contribution reads the issue from the point of view of theologies: are there any points of contact between the two terms of the matter, the acid attacks and theologies? The following reflection runs through this question.

Keywords: acid, gender violence, identity, religions, social redemption, vitriol.

Introduction

In 2012, the European Union was awarded the Nobel Peace Prize for having fostered the transformation of Europe from a continent of war into a continent of peace. Without wanting to diminish the value of this recognition and its motivations, we cannot deny the persistence of conflicts, exasperated forms of dissatisfaction ready to explode, nostalgic references to an ancient world made up of provinces if not of fiefs, of nationalist sentiments, of old and new borders, of screen fears. Some of these wars are fought in the public eye on a battlefield never went out of the body of women. Faced with the resurgence of aggression with acid, the brutal synthesis of atavistic and at the same time subtle evil that expresses, neither ideologies nor politics nor religions can declare themselves extraneous. This form of ancient terror and unprecedented trauma for each victim represents an expression of negative cultural contamination. It is also the proof of how even symbolic weapons can be exported and assimilated, at the very moment when one tries to cancel the different from oneself. The dimensions of the phenomenon in Europe are such that classifying episodes as cases of private and extemporaneous violence would be reductive. This in-depth analysis also questions the incisiveness that these exercise on religions, on the religious vision of life, on the perspective of religious subjects. In fact, the link between the two terms can be established not only with regard to the final outcome of violence condensed in aggression but also in the way in which the role of women is considered alongside that of man in their own organizations. Faced with the cultural emergencies of present-day Europe, religions do not seem to share their resources nor take due account of how one can work to prevent trauma that often results in violence on women's faces. This particular gender violence remains a

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sign of the times it calls for.

As Clay Pots

In recent years in Europe, acid attacks have increased by 120%, between 2012 and 2016 in London there were 1,500 cases, recording an increase of 250% between 2015 and 2016 (Cavestri 2017, Le Point 2017), even the United States is immune (Jarocki 2010). We may feel that brutality unites more than faiths.

When the acid does not kill, it alters the features, dissolving the parts of the body with which it comes into contact, hindering expressiveness and movement. The attacks, voluntary and premeditated, aim to affect not only the person, his identity but also the sphere of his relations. Identity and sociability are compromised. A criminal hand has reached out to the injured person, stealing his or her form, completely remixing it, even making it impossible to recognize himself or herself in the mirror.

In the Bible, we read: *Says the Lord. Indeed, like clay in the hand of the potter, so are you in my hand* (Jr. 18:6).

Some Quranic verses say: *We created man from an extract of clay. And also: I am creating a human being from clay. When I have formed him, and breathed into him of My spirit, fall prostrate before him* (Qur. 23:12).

Those who attack with acid assert dominance, arrogance, are cloaked in the omnipotence of depriving form, which refers to harmony, to life as a finalized project. In the creationist vision of many religions God creates, offering a form, which he himself appreciates and exalts for his attractiveness:

God looked at everything he had made, and he found it very good (Gn. 1:31).

As an unlawful antithesis to the creation, a shameful aggression like the *vitriolage* (the term *vitriol* commonly refers to sulfuric acid. *Vitriolage* is the French word that expresses the use of vitriol to attack) is therefore qualifiable as *dis-creation*, that is, as the *disintegration* of divine creation. It manifests the total contempt for a fundamental and transversal theological message in the religions. In addition to the personal tragedy of every person affected, besides the social significance, this type of violence (so well and sadly engulfed by rich and educated Europe) also directly calls into question religions and their impact with the wider dimension of cultures.

As harmony predisposes to openness, the brutality produced by violence arouses disgust, fear, sometimes shame, embarrassment, all feelings that make every contact more difficult. The same scarcity of studies (Lewis 2017) on the victims, especially on their psychological trauma, despite the consistency of the phenomenon, could be a proof of this. In a society morbidly paid to the plurality and speed of contacts, the low-cost violence of acid conquers the prison of isolation for the victim. It is commonly thought that this type of attack is imported from Bangladesh, Cambodia, India (Avon Global Center 2011), where it is a widespread phenomenon, studied, equipped with specific tactics. Indeed we know

how this kind of attacks has spread in Europe since the nineteenth century (Dasgupta 2008), if not a few centuries earlier (Welsh 2009). As a variant of leprosy, aggression easily scores a real stigma for the victim. On closer inspection, it is cruelly well combined with western societies, following different paths.

The Sensitive Nerve of Emancipation

A sinister and illicit claim lurks in the aggressor's purpose with acid, the arrogance of exclusivism. The evil that claims to avenge is the emancipation, preferably of the woman (Lewis 2017, BBC 2017a, 2017b). The relationship shall be classified by the frame of possession, of the intolerance of real or presumed rivals. In some cases, also registered in Europe, the acid has been thrown against male subjects considered dangerous rivals in career advancement or in possession of a property. In substance, these are cases matured in the emotional or working environment, behind this weapon hides the desire for uniqueness. That refers, once again, to the fundamental idolatry of replacing the One of the monotheistic religions. The monstrous flooding of the ego advances absolutist demands and ignores any form of positive relativism, of the agreement, of discrepancy with respect to egocentric and paranoid logic.

Attack with acid is an extreme manifestation of supposed control of the other, of idolatrous revenge, because it alters connotations that manifest the work of God, in the creationist reading of many faiths. Their incisiveness and numerical growth do not exempt from a cultural analysis of a context that at least does not sufficiently feed a different reaction to frustration. The religious code considerably nourishes the social fabric, penetrates the formation processes: what kind of relapse has these circumstances? Theologies contribute to defining the high value of individual physiognomy as an expression of creation, exalting the person in itself from an aesthetic point of view.

On the other hand, it is appropriate to focus on the difficult relationship of religions with gender equality. In some areas of the world, including Europe, equality is accompanied by equal opportunities, the possibility of universal access to the functions of the modern world, progressively distancing each pre-comprehension of established roles. But that does not always find continuity in the specifics theologies, in the interpretation of sacred texts and traditions. Many religious confessions mark clear boundaries between the tasks assigned to man and those assigned to women. Many confessions admit only men to the ministry. In many cases, the distinction is poured into ritual, both as regards the type of practice and sometimes as regards the reserved places in the temples. These are gestures and rites handed down through the centuries. The communities of faith often consider them untouchable, bearers of values in themselves, not subject to historization, the result of dynamics far removed from the object of this study.

Yet, with a view to that part of the world wishing to decline equality in the sense of total practicability of the boundaries associated with tradition to man and woman, making a threshold to a genus accessible and denying it to others is perceived as a discrimination. And to the part of the world that does not digest this

kind of modernity, postmodernism and their outcomes, those traditional prohibitions, selected at least formally according to gender, may seem a justification of a natural order. According to that interpretation one gender predominates over the other that must accept it. Even starting from simple considerations such as these, one can see how religions enter in every case into social and cultural dynamics, which sometimes also produce extreme phenomena.

Moral codes continue to propose models, largely inspired by religious teaching: they propose universal ideals, which are valid for everyone, men and women. By going into the specifics of the behavior, do they also promote the same expectations? Do they derive the same seriousness from any infractions? Or do they apply the criteria also on the basis of gender distinctions? Although a religion may not be practiced, its teaching has been handed down through family pedagogy, of the community of faith, of part of society, and it is known and represents a point of reference.

Another meaningful and cross-cutting topic is female sexuality and the way it is also represented in the media. The debates on the full veil, and in some cases, the ratification of specific laws, flash here and there political environments and TV talk shows. The continuous overexposure of the female body in the banalest circumstances should not be underestimated. To claim a total exclusiveness on the image of the woman or to consider normal the reduction of her body to a sexual object are not they two sides of the same coin? Without boiling in either a positive or negative sense, neither one can ask why one does not observe analogous phenomena, with the same frequency, concerning men.

Nowadays, in globalized societies, where there are many small worlds, each with its own baggage of morals, traditions, and convictions, it is more than ever difficult to find shared principles. In many European countries information campaigns have been undertaken and legal initiatives have been taken against practices such as child marriage, infibulation, honor killing, forced marriage: they are seen as a violation of fundamental rights. Indeed the attack with the acid causes multiple rights at once. Deepening these issues in a synoptic way, looking at the same time as cultures and religions declined in the plural also fosters awareness that some consolidated imbalances do not place their roots outside, but in the heart of Europe. That calls different agencies to the urgency of find common paths for the welfare of companies as well as individuals. In the woman seem to emerge ancient and new boundaries able to tragically sculpt a hierarchy of roles. That does not find rational or theological justification, but which reveals certain anthropologies and traditions still reluctant to be overcome.

And the theological reflections? Do they assist women in emancipating from the cultural diving suits that others try to make them wear?

The Face of God and the Theologies

In the Judeo-Christian Bible, hundreds of recurrences contain the *face*. With the exception of the incarnate God Jesus, approaching God's face is a contradiction in terms. No image could fully represent him. Yet the relationship with God, the

presence of the believer in front of him, the need to sense his presence, is often condensed in the notion of *face*:

*When you said, "Seek My face",
My heart said to you, "Your face, Lord, I will seek".
Do not hide Your face from me (Ps. 27:8-9).*

A desire is projected onto the face of God, and that has the flavor of the relationship, of immortality, of finality. The idea of the face suggests contact, the possibility of interacting. The absolute sacredness of the face of God is such that it does not let itself be looked upon as any other face. Indeed, to Moses who wishes to scrutinize the appearance, the Lord says:

You cannot see My face; for no man shall see Me, and live (Ex. 33:20).

Jewish theology highlights the complexity of the theme, in which the revelation connected to the face is accompanied by its concealment. For the believers that remains a motive for research and finds no synthesis in the figurative representation.

Within each religion and among religions, a large part of the theological debate is dedicated to the lawfulness or otherwise of the representation of the divine. The outcomes are different, ranging from the image, which incorporates rituality and is interpreted as a divine presence, to the total prohibition of iconoclasm. It is a sign of how complex the subject is and how interconnected it is to holiness, which is offered, but which, at the same time, remains inaccessible because God expresses it in totality.

Christianity itself, which indicates in Jesus Christ the *image of the invisible God* (Col. 1:15), does not reduce the difficulties, but keeps them all intact within, covering a variety, ranging from refined iconology to the total prohibition of becoming an image. Beauty in Christian art is expressed happily in the human figure, with particular reference to the features of the face.

In contrast, the Islam universe places the decoration and the art of writing, calligraphy, in an exceptional position. The foundation of the absolute uniqueness of God is most easily reflected in the abstraction of geometries, in the momentum of minarets and towers. Each geometric figure is a sequence and an intelligent combination of points and each point refers to God, who is everywhere. More than realistic representation, Islamic figurative art stimulates the association of ideas, the leap, as well as bridging the gap between human and divine, that is other than human beings:

... wherever you might turn, there is the face of Allah ... (Qur. 2:115)

From the human perspective, the face of God is the purpose of every movement and of every gaze of man, who in every situation seeks God and needs him. The form is a derivative, it is the prerogative of the creatures and the work of the Factor:

... your Lord, the most Generous ... He Who created you, and formed you, and proportioned you ... in whatever shape He willed, He assembled you.... (Qur. 82:6-8)

The image is a direct expression of God's creation, therefore God is appointed to forge a form, some features. In the Quran, the image is the result of God's action. And, in return, the form is a sign of the divine spirit.

The religious background earlier than Islam gave ample space and value to images as an instrument of relationship with the divine. Islam, presenting itself with a break in continuity, empties the image of the value of the religious medium, which the pre-Islamic Arabia, on the contrary, recognized. As a result, Islamic places of worship are inaccessible to icons and statues, considered as distraction and danger of idolatrous substitution. This elaboration developed in the Sunna leads to the particular condemnation of the painters on the day of the Resurrection when they will be challenged to make alive what they have created (Bukhari 7557).

Giving a shape analogous to the animated one, looking human being or animal, can be understood as trying to create, substitute for God, being idolaters and facilitators of idolatry. It is not equivalent to underestimating the image, but to recognize the unique value of God's work, due to him alone.

In articulating his relationship with God in a known language, the human being preaches the face of God and the sacred text welcomes this desire and takes up its formulation:

Everyone upon the earth will perish, and there will remain the Face of your Lord... (Qur. 55:26-27; 28:88)

A symbolic or effective place in the eternal dimension, it remains the reason and stimulus of the healthy tension of the believer towards God. It is despicable and out of place to take the absence of the vision as a pretext for one's own infidelity (Qur. 25:21). The text, instead, supports the intimate and deep desire of the vision of the face to promote submission to his will.

... you do not spend except seeking the face of Allah ... (Qur. 2:272)

The believer follows an approach movement to God that is reflected in his daily actions, which, in turn, are so invested with the value of the right faith.

The Sacredness of the Human Face and the Theologies

The face of God brings with it the finality of the movement and the gaze of the creature. By extension in Islam the human face is characterized from the fact that he moves towards God:

We have certainly seen the turning of your face, toward the heaven, and We will surely turn you to a qiblah (the arabic word qibla means direction) with which you

will be pleased. So turn your face toward al-Masjid al-haram. And wherever you [believers] are, turn your faces toward it (Qur. 2:144).

The Islamic concept of the face is dynamic and imbued with a human-divine relationship. The face of God is the aim of the search for the human being, the subject who researches. The orientation movement is typical of Islamic prayer, it belongs to the design of the mosques and to the arrangement of the bodies. But in the end, it is the bearer of an all-encompassing meaning. And, once again, the face in the culminating act of canonical prayer prostrates itself to touch the earth, when it turns obediently to God and searches his face. The face combines the person and fully expresses its ability to interact with otherness, to tend towards the divine otherness. However, this is something else, so that the face is hidden, matching with the earth while invoking God. Furthermore, the face multiplies its expressiveness by counting on a series of veritable holes, eyes, mouth, and ears. The Quran itself indicates in the eyes the reflection of the intimate feel (Qur. 25:74, 40:19, 10:26). God also arrogates the cancellation of the face. That can be interpreted as a condition that makes it impossible to follow the way of God, typical of a moment from which those who have not converted before can no longer do so:

O you who were given the Scripture, believe in what We have sent down ... before We obliterate faces and turn them toward their backs ... (Qur. 4:47)

The dramatic metaphor reaffirms the identification between being alive and having a face. Obliterating it by overturning means losing the fundamental ontological prerogative, that is the orientation towards God, for Islam, the path in its direction.

Buddhism has reflected a lot on the form in general, especially in relation to its transience. The representation of the Buddha, that is of the awakened one, encompasses many symbolisms more attentive to the transmission of relevant contents than to the disclosure of an image for itself. For this reason, it is all the more interesting that we reflect on the search for the primordial face or the original face, a typical expression of Japanese zen and the issue of traditional *koans* (*Koan* is a term that Japanese Zen Buddhism has taken from the Chinese. Literally and originally it indicated the *public notice*. In Zen spiritual life it is equivalent to statements and stories proposed by the master to the disciple to meditate). When we meet the profound nature of the self, we finally come to contemplate the original face.

Catholicism has always given ample space and value to the representation of the face of Jesus Christ, often called holy. Son's face is at once a painful, glorious, transfigured face. The fully expressive face of the Son is experienced as a mirror in which every creature can find himself or herself until he or she plunges into a mystic correspondence. The theological pillar of incarnation generated a dense anthropology inspired by the theology of the true God and true man. The face of Christ in Orthodox iconology is more hieratic, but no less honored. This is why in every creature, in every animated face, the Christian recognizes Christ, an expansion of the Jewish theology of creation in divine image and likeness.

The Disfigured Face

The contribution of theologies on the theme of the face converges on considering it a particular expression of creation. This the prerogative of God in theistic and creationist visions, and in any case a representation of origin and authenticity. The criminal action, which disfigures the face purposely, or ignores or supplants the consequence of theologies, achieves an idolatrous behavior in its deepest substance. Similar behaviors mostly affect female identity, as if God did not exist. They act as if there were no other plan of reality that is not the abnormal and unbalanced ego of those who commit the crime: this is a challenge to religions.

Criminology has long investigated the aggressor's face, physiognomy (the most direct reference is obviously to Cesare Lombroso, 1835-1909) has been applied to forensic criminology. What is the face of the attacked person? It is no longer possible to recognize it after the acid attack. It is a life in a state of suspension, with the killing of previous expressions, which composed the rich array of the non-verbal language of the face. Often, at first sight, only the reaction of repulsion can remain. It is as if a mechanism of retribution arises for which the rejected individual becomes an aggressor and condemns the other to be rejected for life because of his non-face.

Acid is a cheap weapon and offers the cruel revenge to leave alive with terrible and permanent damage. It must be assumed that many aggressors prefer acid because of its cheap price, remaining much more indifferent to all its implications. This kind of aggression contains a sort of contempt, for which the victim is not considered worthy even to die. The aggressor prefers to condemn her to a life sentence, a life stolen from a non-neurological but aesthetic and emotional Alzheimer's, with the aggravating circumstance of a painfully intact memory and sometimes irreparable damage to sight or other faculties. The moral sense of the aggressor is completely silenced, or, more or less consciously, *breached*, erasing every kind of limit, self-limitation, inhibition. Every type of regulatory, moral conditioning is in fact irrelevant. At the moment of aggression, the only imperative is dictated by the aggressor's desire to do evil.

The aesthetic of the revenge dominates the scene in the impotence of the theological substance of any provenance. This does not mean that theologies must ignore the situation. The face is a sensitive place of theology, connoted by the sacredness, emblem of creation in itself. The divine can take many faces, leaving the authentic face unknown or invisible, too holy to be distinguished as a common face. The breakthrough of morality is due to the substitution of the divine with the ego of the aggressor, to a desensitization of the creatural sentiment, which makes recognize a creature in the other that one pretends to disfigure. Education for the recognition of the divine and his work in creation, the refinement of the sense of beauty, are tools available to theologies to counteract the eating-face counterculture. The current situation should encourage theologies to nurture anthropology to promote respect for the divine and morality in the other person.

Moving on from the Clay

The believing perspective deals with evil does not allow itself to be won by it. In the many faces of the divine, also the one disfigured by evil appears. The loose face loses its original features, is disoriented from perceiving itself as clay without form and model.

Svetaketu asked: "What is that instruction, venerable Sir?" "Just as, my dear, by one clod of clay all that is made of clay is known, the modification being only a name, arising from speech, while the truth is that all is clay; "Just as, my dear, by one nugget of gold all that is made of gold is known, the modification being only a name, arising from speech, while the truth is that all is gold; "And just as, my dear, by one pair of nail–scissors all that is made of iron is known, the modification being only a name, arising from speech, while the truth is that all is iron—even so, my dear, is that instruction." (Chāndogya VI, 1, 4-6).

Theologies in the face of the victims are a substance of rebirth that relativizes the form and projects towards a new design, full of difficulties, pain, new things to be faced. All that is known, with a loose face, similar to clay, is not given, but always conquered. The title *clay army* wants to allude to the number of people, whose shape has suffered a remodeling, as if it were made of clay. But it also refers to their exceptional strength, comparable to that of an army fighting for their own dignity for their rebirth. The stories of acid attacks in Europe deliver pages of extraordinary courage to history, capable of even giving light to our times often dark and fragile. Theologies are called to meet each other around the slits of scars, on the theme of the beauty of clay. That is not modeled, but it is able to emerge in the new force that is often the merit of women and their energy. The current state of affairs recalls the urgency of linking the faiths to the experience, of taking responsibility for the spirituality of the human being. Many theologies recognize him or her as the work of God. Body and its spirituality, the sacredness of the other and of his or her will need greater theological attention. Along with the thread of fragility, combining theologies in the plural, is more than ever necessary. If the divine is recognizable in the faces of clay, everyone can identify a little and reach a more profound form of his or her spirituality as a common and mutual antidote to violence.

Conclusion

The spate of acid attacks in Europe clashes strongly with the idea of civilization and progress, that is something the continent relate to. The phenomenon is often connected to the desire for emancipation of women from the family context, drawing a typical expression of gender violence, though men are not totally spared. The two factors are mixed, indicating an underlying difficulty in conceiving the feminine and the masculine in well organized societies for equal opportunities and much centered on individual freedom. This paper has set itself the aim of exploring the issue in the light of the theme of beauty and face in

religions (Judaism, Christianity, Islam), that developed a more comprehensive discussion and are deeply rooted in the European context. From the point of view of theologies the face is an emblem of the relationship; it is the privileged door that connects the heart of each person with the outside world. In addition, the work is creative privileged manifestation of God. Clear it, as is the effect of the acid, is from the theological point of view not only a form of murder of the person affected, but also a serious idolatry, since it presumes the facts to erase what God has done. The acid attacks therefore also reflect a proof of the weak social relapse of religions with regard to their deepest core. On the other hand we must recognize that the victims of the attacks originate important evidences of redemption, identity reconstruction around a renewed concept of beauty. That is able to rise from the ashes of the violence, even feeding on spirituality. This also invite you to see the true source of beauty interiority, in its spirituality and especially in its ability to scroll through the continuous flow of creation.

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An Integrated Multilayer Approach for Environmental Impact Analysis of Large Scale Infrastructure Projects (The Case of Tehran-North Freeway, Iran)

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& Hamid Fathi[‡]*

This paper attempts to examine spatial strategic planning in terms of the regional economic development of Tehran-North freeway project. The paper introduces an integrated method to compile and prioritize strategies in order to optimize the environmental impacts of such projects and then develops and tests the model with data for the specific regions. This proposed methodological approach combined with strategic planning could be used to control and reduce the environmental impacts in the south, central and north Alborz Mountains as part of the project. The main result of this paper is to provide amendment strategies for areas with greatest environmental vulnerability and sustainability as a critical driving force for achieving increased regional development and thus the tailoring of policies to support regional economic development and growth.

Keywords: *Environmental impact assessment, Infrastructure projects, Strategic planning, Tehran-North freeway.*

Introduction

The concept of strategic planning giving structure to regional economic development had tended to be ignored traditionally by planners and economists who recognized only the significance of mega - project at the national level without attention to environmental or social impacts (Sharifzadegan et al. 2015). Any infrastructure or large-scale project will likely have different impacts on the surrounding environment both in a negative and positive ways. One of the typical kind of large scale infrastructural projects are transport infrastructure development projects with a great impact on the quality of the regional development. Moreover, strategic planning is a kind of planning that defines and compiles strategies in different scales more specifically in regional level. It is basically a process of mid and long term harmonization of the internal and external opportunities and resources around organizational goals. Strategic planning was initiated in 1950s and became commonly used in the 1960s and 1970s and has become more widespread in the 1980s and 1990s. Today, it is used in urban and regional planning by most city authorities and development organizations. Researchers have proposed very diverse and different methods for guiding strategic planning but they usually apply SWOT matrix as a common method for guiding the

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strategic planning research (Hill 1995, David 2001).

The purpose of this paper is to present an integrated method for compiling and prioritizing strategies by integrating the Delphi, AHP, SWOT and QSPM techniques. Demonstration of this integrated methodology is applied in an effort to control and reduce the impacts of the construction of Tehran-North freeway on its surrounding environment in the south, central and north Alborz Mountains zones, which is located across the freeway from Tehran to the North.

Tehran-North freeway is one of the most important infrastructural transportation projects in Iran, with great environmental, economic, social, physical and transportation development potentials. The freeway starts in the Kan region in Tehran province and ends in the Chalous region in Mazandaran province with 120 km length (Road and Urbanization Ministry 2014). The project aims to provide a safe and high-speed transport connection between the north and central parts of Iran, while also facilitating connections with the neighboring countries to the north.

Early studies on the Tehran-North freeway project began in 1974 and after the Islamic Republic Revolution of Iran in 1979, studies on the freeway were put on ice by the Road and Urbanization Ministry. Later in 1984, Islamic Revolution Mostazafan Foundation assured to take over the responsibility for construction of the Tehran-North freeway and finally in 1987, Tehran-North Freeway Company was established with the mission to prepare a detailed study and design for the freeway. Against this background several consulting engineers were asked to develop strategic planning studies of Tehran-North freeway since 2006. This article is part of the studies, which were carried out by the authors of this paper between the years 2011 to 2013 and eventually approved by the High Council of Architecture and Urban Planning of Iran (The Ministry of Road and Urbanization in 2014).

Strategic Planning: Neglected Way of Planning in Iran

In the literature of planning theories, there exist two origins for the concept of "strategy". The Latin word "Stratum", meaning the way for movement, and the Greek word "Strategos" having a general and overall meaning. The terminology "strategy" was for the first time identified in the late 19th century as the importance of war tactics grew and especially in the military context.

Today the concept is used in many fields, including political, economic planning and especially management. The strategic planning routes in the field of management were used as a general scheme that serves as an overall plan for facilitation of efficient management for achieving the overall organizational objectives. To this sense, concepts such as mission, vision, goals and objectives fall within the framework of strategic planning (Kazaz and Ulubeyli 2009).

In Iran, as a developing country, it is more than 50 years that comprehensive plans are applied in diverse scales of urban and regional development. Such a planning methodology has not been capable of solving complex urban issues. The complexity of urban problems in post industrialized developed states, especially in

late 1960s, and the constant changes of urban issues during the more than 20 years after the World War II both in political and economic attitudes as well as criticisms to the traditional approaches of planning in the second half of 1960s naturally resulted in changes and general views on planning, especially urban planning. Moreover, the impacts of other disciplines such as sociology on planning helped to identify the shortcomings of the traditional methods of physical planning and orientation of customary planning from comprehensive to systematic ones.

The systematic ideology on planning is in contrast with the traditional approach (i.e. comprehensive ideology) as a static approach to devising planning policies. The traditional approach has always introduced a comprehensive and broad rational theory on planning and stressed on the possibility of reviewing and monitoring the planning procedure. This will eventually lead to manifestation and acceptance of the ideology of spatial planning (meaning attention to the social, economic, political, organizational and managerial aspects along with the physical aspects of planning) and strategic planning.

This simplistic attitude of planners in urban development to change political and social procedures instead of giving attention to public interests and providing freedom were amongst the elements of traditional methods that were questioned and criticized by the new and emerging approach called strategic planning (Mintzberg 1994, Price and Newson 2003).

The proponents of strategic planning assert that this kind of planning not only creates guidelines for local development but also brings about coordination among different sectors on the scale and location of future development in regional levels and creates intra-sectional correspondence (for instance between application of land, housing, transportation, education, facilities, economic development and other activities). So, on the one hand, strategic planning attaches essential importance to development management and consequently, it pays attention to local management. On the other hand, it is closely related with spatial planning due to the fact that it acts within the framework of geographical space, which is an output of a synthesis of physical, economic and social factors in a certain location. Yet, we believe that another outstanding characteristic of strategic planning is that it does not act on certainty when forecasting or predicting; rather, it is always faithful to the laws of non-absoluteness of phenomenon in development.

As for methodology, it should be said that one of the most important concepts in strategic planning is the strategic ideology, which enables one to turn mental issues into real ones. Meanwhile, it should be possible to bring about realistic outcomes out of mental thoughts and reach long-term, general and influential prospects and views through passing from unknown and unpredictable factors. It should not suffice merely to provide details of the present; rather, it should also focus on major factors affecting the future. Therefore, if there have been three basic phases of planning namely; "current conditions", "analysis" and "prediction" important in the traditional method of planning, there should be at least four more phases in strategic planning alongside the phases on the basis of planning procedure and the characteristics of planning and strategic ideology accordingly. These additional phases are:

- Determining specific goals of the subject under planning
- Making alternatives and their assessment
- Implementing and setting strategies
- Implementing plans, monitoring and revising them

In this context, strategic thought serves as the first step in the strategic planning procedure both in developing and developed territories (Mintzberg 1994, Porter 1987).

Study Methods

The research methodology is elaborated on a combination of qualitative and quantitative methods. This includes an integrated method comprised of the SWOT, QSMP and AHP models with the aim of mitigating the environmental impact of large scale infrastructural projects.

SWOT Matrix

The SWOT matrix is a helpful method for analyzing an urban system. With SWOT the effects of creating a project can be analyzed, which might not have been part of what the analysis was commissioned for due to internal and external factors (Talaie et al. 2009, Kandakoglu 2009, Podvezko et al. 2010).

The SWOT matrix comprises four main factors, including strengths and weaknesses (internal elements) and opportunities and threats (external factors). The comparison of the Strengths and Opportunities results in the Strength-Opportunity (SO) assessment. Also comparison of the strengths and threats produces the Strengths-Threats (ST) opportunities assessment. Moreover, comparison of the weaknesses and Opportunities will yield Weakness-Opportunity (WO) strategies and comparisons of Weaknesses and Threats would result in Weaknesses-Threats (WT) strategies. Eventually, by using a SWOT matrix, one can develop different strategies, which can be prioritized according to their relative importance (Chang and Huang 2006). Moreover, the SWOT method is used in defining key internal and external elements, which are important in helping an organization meeting its goals (Houben et al. 1999). In addition, the internal and external factors derived from SWOT analysis help identify strategic factors. The SWOT method compiles strategies based on the strengths and weaknesses as well as opportunities and threats (Kandakoglu et al. 2009). Moreover, SWOT promotes strengths and opportunities while minimizing the threats and weaknesses, and changing weaknesses into strengths so that while pursuing opportunities one can minimize internal weaknesses and external threats (Chang and Huang 2006, Amin et al. 2011).

QSPM Model

The "strategies definition" state could be subdivided into the following three stages:

- Stage 1, "input stage": preparation of input information based on the external and internal factors.
- Stage 2, "matching stage" : generation of alternative strategies
- Stage 3, "decision stage": integration of the quantitative strategic planning matrix (QSPM). Together with SWOT matrix, this model would be used to determine the degree of attraction of the compiled strategies. Using this model, one can identify objectively different high potential strategies (David 1983).

In other words, the strategies revealed by the SWOT matrix are prioritized by QSPM in order to select those strategies that are more reliable and achievable (David 2001).

Delphi Technique

Dalkey (1969) and his associates originally developed the Delphi technique in the 1950s. This method aims to gain access to mental and cognitive convergence in the thinking of specialists and experts in different dimensions. Basically, structures of the Delphi method focus on a complex problem so that, over several iterations, a team or group can find an agreement about a future matter (Hasson et al. 2000). This method has several primary characteristics as below:

- Problem definition
- An expert panel that represents a broad opinion on the subject being examined. These experts are usually anonymous.
- The researcher constructs a series of questionnaires.
- An iterative process contains three to four iterations of questionnaires and feedback reports.

Although three to four iterations are normally used, iterations should be stopped when convergence is achieved. At the end, the researcher should apply a final report and shares it with the Delphi team for final edits and comments (Hasson et al. 2000).

Analytical Hierarchy Process (AHP)

The AHP model was developed by Saaty TL in 1970s. This model is based on three levels. The first level addresses model structure issues by collecting the objectives, indices and alternatives. The second level is to compare indices and alternatives and the third level is to prioritize the indices and choices. The AHP model has diverse applications in solving complicated issues in the decision making process (Kurttila et al. 2000, Albayrak and Erensal 2004, Lee et al. 2011).

In the AHP model a one by one comparison judgments are made to determine the correlation of importance among indices and sub-indices. The basis of judgment for the comparative judgments is addressed in Table 1.

Table 1. Interpretation of Entries in a Pairwise Comparison Matrix

Value of a_{ij}	Interpretation
1	Objectives i and j are equal of importance
3	Objective i is weakly more important than objective j
5	Experience and judgment indicate that objective i is strongly more important than objective j
7	Objective i is very strongly or demonstrably more important than objective j
9	Objective i is absolutely more important than objective j
2-4-6-8	Intermediate values-for example, a value of 8 means that objective i is midway between strongly and absolutely more important than objective j

Source: Saaty 1980.

In the third level of AHP model, the correlation of importance of choices is determined. In this phase, the priority of the options in connection with each of the sub-indices, if any, is judged otherwise, the connection is determined directly with the indices themselves. At the end, the final score of options is determined. In this phase, the final importance score of each option is determined. To this end, the principle of hierarchic composition leads to a Priority Vector (PV) by taking all judgments in all hierarchical levels into consideration.

Using the AHP model requires the direct participation of the decision makers who are best informed to make two-by-two comparison of indices in relation to each other. In this process, using other models of polling in composition with the AHP model can be helpful. Furthermore, using the AHP model can be helpful in case that goals of assessment are clear and the criteria are determined as well as the options of comparison are taken into consideration (Handfield et al. 2002).

Methodology of the Proposed Model

In this article, we propose an integrated model by combining the Delphi-AHP-SWOT-QSPM for strategic planning purposes. Using this integrated model helps to understand the current situation better and to compile and prioritize the strategies with more accuracy and adjustment. This integrated model is used for the evaluation of trio Alborz zones vulnerability in order to identify and prioritize the best strategies for monitoring and reducing impacts of the Tehran- North freeway construction.

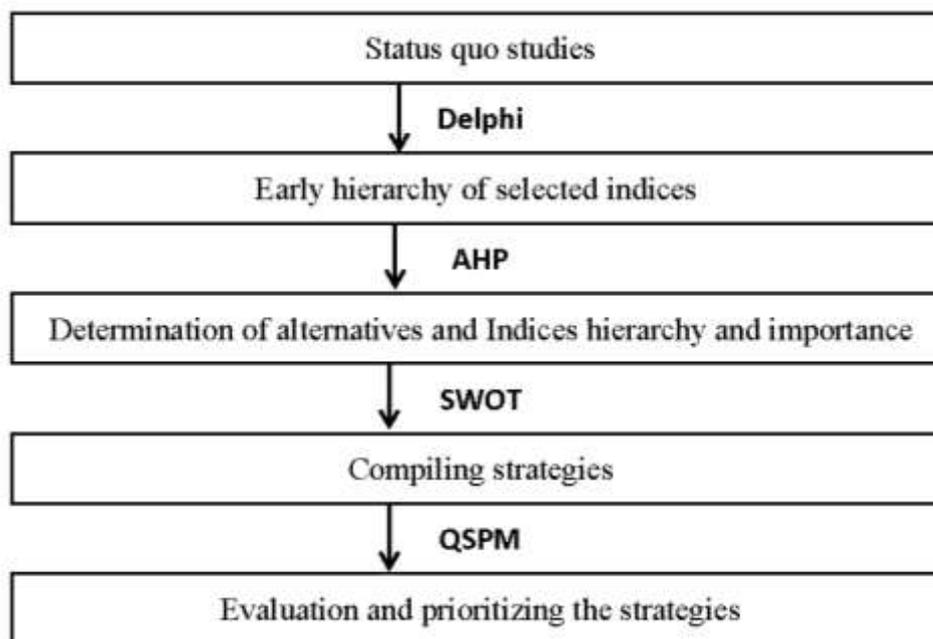
To do so, as an integrated process, the current situation is studied and described to the Delphi team in several workshops (incl. video conference or through email). Second, a variety of indices are selected for assessment based on the planning objectives. These indices are prioritized by the Delphi team. Third, initial indices are examined again by the AHP model and the hierarchies of alternatives are determined compared to each other. The applied AHP method in

this article aims to identify that ‘Which of trio zones of Alborz Mountains are more vulnerable to Tehran-North freeway construction?’. Thus the trio zones of Alborz are defined as AHP study areas.

In the next step, the SWOT method is applied to analyze the current situation through identification of strengths and weaknesses (the internal factors) and the opportunities and threats (the external factors) and to compile the strategies. Finally, the best strategies are prioritized by using the QSPM method.

The combination of Delphi and AHP methods in this paper helps to improve the reliability and validity of measures. The reliability of measures in the Delphi method differs from one panel to another and the results in the final round of judgments might be due more to some pressure. Furthermore, the composition of the Delphi method, the AHP model and the SWOT and QSPM matrix, used in this article, helps to bring conformity across all points of view, bringing further consensus on the goals. Figure 1 shows the structure of the proposed model.

Figure 1. *Structure of Proposed Model*



Implementation of Proposed Model

Interview of Delphi Team and Identification of Indicators

During May and December 2006, a group of experts including 40 experts were selected as the Delphi team. They were put into three economic, environmental as well as transportation groups and were asked to specify the strengths, weaknesses, opportunities and threats of the freeway in each of the above mentioned dimensions. The team of experts and researchers then extracted various indices to evaluate impacts of the freeway on the surrounding

environment. Using the Delphi method, the experts were asked to determine the importance of those groups of indices with respect to the issue under study. Before starting the Delphi procedure, the authors presented necessary guidelines about the freeway project in several workshops. The working groups helped bringing about convergence and solidarity among directors, experts and authors so that all participants became acquainted with the issue closely.

Before starting the rounds of the Delphi method, the authors selected seven indices that were considered important to achieving the objectives of the project including: (A) soil and capability of lands, (B) plant and animal ecology, (C) climate, (D) geology, (E) risk of tremors, (F) topography and (G) construction. Following this, a questionnaire was created based on the chosen indices.

At the first round, the Delphi team was asked to determine priorities in accordance to the objectives. At the second round, the collected responses were summarized by the authors of this paper. Next the summary results were sent back to the Delphi team to review and resubmit their opinions. At the third and final round, an early hierarchy of importance of the selected indices was determined by aggregating the ratings (Table 2).

Table 2. Early Hierarchy of Selected Indices by Delphi Technique

Indices	Early Hierarchy of Selected Indices
Soil and capability of lands	2
Plant and animal ecology	1
Climate	4
Geology	7
Risk of tremors	6
Topography and steepness	5
Construction	3

Determining Final Correlation of Indices

Table 3. The Matrix of Two-By-Two Comparison of Indices in Three South, Central, North Alborz Zones

	A	B	C	D	E	F	G
A	1	1/2	3	7	5	4	2
B	2	1	4	8	7	5	3
C	1/3	1/4	1	4	3	2	1/2
D	1/7	1/8	1/4	1	1/2	1/3	1/5
E	1/5	1/7	1/3	2	1	1/2	1/4
F	1/4	1/5	1/2	3	2	1	1/3
G	1/2	1/3	2	5	4	3	1

$$A = \sqrt[3]{1/2 \times 1 \times 7 \times 5 \times 4 \times 3 \times 2} = 2.37$$

$$B = \sqrt[3]{2 \times 1 \times 4 \times 8 \times 7 \times 5 \times 3} = 2.88$$

$$C = \sqrt[3]{1/3 \times 1/4 \times 1 \times 4 \times 3 \times 1/2} = 1$$

$$D = \sqrt[3]{1/7 \times 1/8 \times 1/4 \times 1 \times 1/2 \times 1/3 \times 1/5} = 0.28$$

$$E = \sqrt[3]{1/7 \times 1/5 \times 1/3 \times 2 \times 1 \times 1/2 \times 1/4} = 0.42$$

$$F = \sqrt[3]{1/4 \times 1/5 \times 1 \times 2 \times 3 \times 1/2 \times 1/3} = .65$$

$$G = \sqrt[3]{1/2 \times 1/3 \times 2 \times 4 \times 5 \times 3 \times 1} = 1.53$$

$$W_A = \frac{2.37}{9.15} = .25$$

$$W_B = \frac{2.88}{9.15} = .31$$

$$W_C = \frac{1}{9.15} = .10$$

$$W_D = \frac{0.28}{9.15} = .03$$

$$W_E = \frac{0.42}{9.15} = .04$$

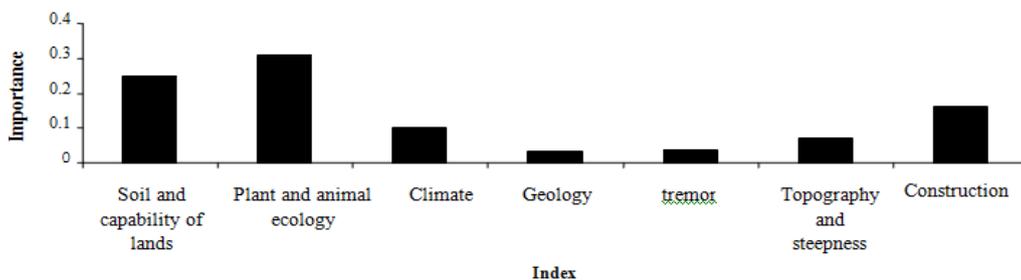
$$W_F = \frac{0.65}{9.15} = .07$$

$$W_G = \frac{1.53}{9.15} = .16$$

After determination of the early hierarchy of indices' importance through the Delphi technique, the hierarchy and final correlations of indices' importance were determined. To this end, first of all, each of the indices were determined and then each of the indices were compared with each of the trio-zones of Alborz. As a result, 21 counts of comparison were made to determine seven indices. The comparisons were put into two-two matrixes of indices (Table 3).

The Figure 2 shows that indices of plant and animal ecology, soil and farmland, construction, climate, topography and steepness received the first to fifth priorities respectively.

Figure 2. Comparing Weights of Indices on Macro Scale and in Three South, Central and North Alborz Zones



Having determined the priority of indices, all indices were tested in each of the South, Central and North Alborz zones and the priority of each of them compared to indices were determined (Table 4).

Table 4. Determining Priority of Each of the Trio-zones of Alborz, Compared to Selected Indices

Indices	Priority of each of the trio-zones of Alborz		
	North Alborz	Central Alborz	South Alborz
Soil and capability of lands	1	3	2
Plant	Ecology	3	1
Animal		2	1
Climate	1	2	3
Geology	1	1	1
Tremor	1	2	2
Topography and steepness	3	1	2
Construction	3	1	1

Having determined the priority of each zone in comparison to the selected indices, all indices are processed through two-by-two comparison and by formation of 3×3 matrixes in each of the three Alborz zones. At the last stage, the final score of each of the zones was determined through a mixture of the two-two comparison. Hence, multiplying the weight of each indices in the correlation of the priority of each of the zones, the score of the zone with respect to the indices is estimated. Collecting the value of all the scores, the final score for each zone is determined (Table 5 and Figure 3).

Figure 3. Comparing Degree of Importance for Each Index Compared to Each Zone of Alborz

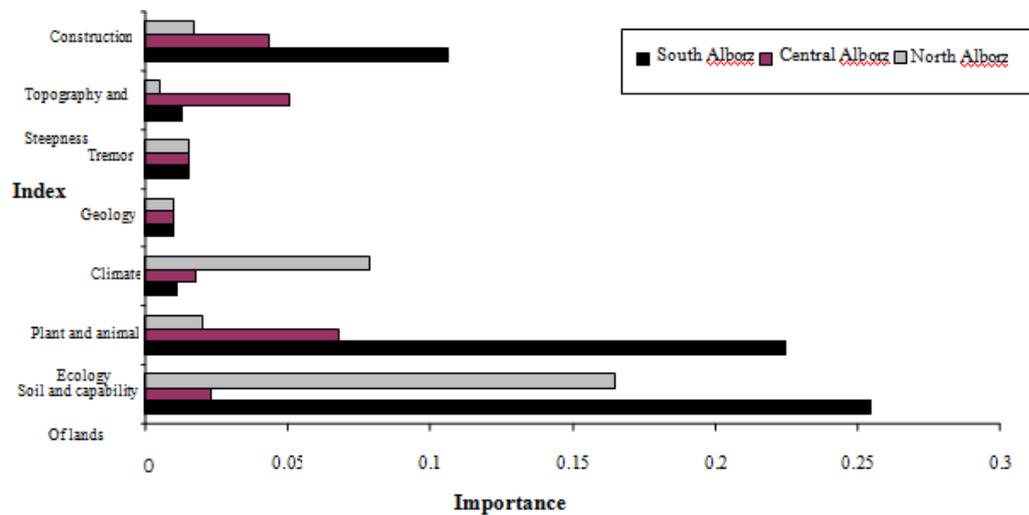
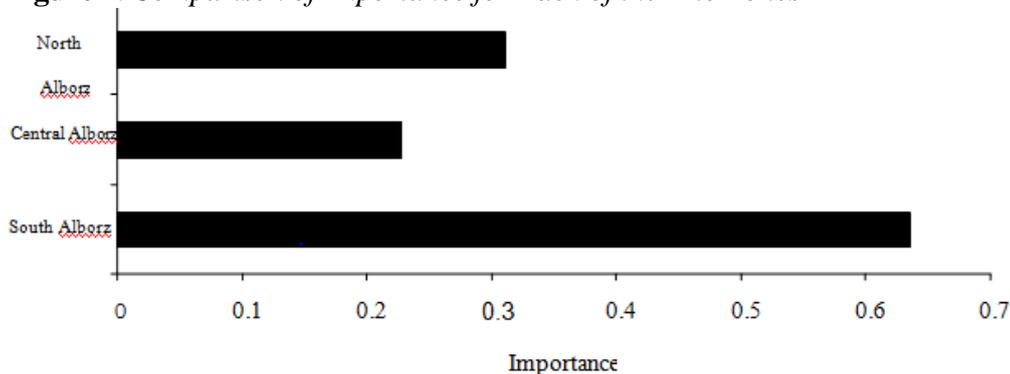


Table 5. Final Score of Each Choice With Respect to Indices and Correlation of its Priority

Index Zone	Soil and capability of lands	Plant and animal eco	Climate	Geology	Tremor	Topography and steepness	Construction	Final score
South Alborz	0.225	0.255	0.011	0.010	0.015	0.013	0.106	0.635
Central Alborz	0.023	0.068	0.018	0.010	0.015	0.051	0.043	0.228
North Alborz	0.165	0.020	0.079	0.010	0.015	0.005	0.017	0.311

As observed, with regard to the processing and testing of indices in different fields, using the Delphi and AHP methods, the final score of the trio environmental zones of Alborz was determined using the index scores, which clarifies the degree of vulnerability. A clear result is that the South Alborz environment zone is more at environmental risk compared to the North Alborz and the North Alborz is more at risk compared to the Central Alborz. The conclusion is clearly shown in Figure 4.

Figure 4. Comparison of Importance for Each of the Trio Zones

In the hierarchical analysis method there still exists a lack of coordination in judgments. Therefore, it is necessary to apply a measurement tool to minimize the degree of non-coordination in judgments. The method to investigate the inconsistencies in judgments is the coefficient of calculation, called "Inconsistency Ratio" (IR) that is gained out of dividing the "Inconsistency Index" (II) by "Random Index" (RI).

If the coefficient rate is less than 0.1, the consistency in judgments will be acceptable; otherwise, it would be necessary to reconsider the judgments. In another words, the matrix of pair-wise comparison of indices should be re-set. The Inconsistency Ratio is gained by equation 1.

Equation 1. Inconsistency Ratio

$$C.I = \frac{\lambda_{max} - n}{n - 1}$$

The Random Index can be obtained with respect to the number of indices (Table 6).

Table 6. Random Index (RI)

n	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R.I	0.0	0.58	0.9	1.12	1.1	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

In the geometric mean method, an estimated method, L is used instead of calculating the special maximum degree (Equation 2).

Equation 2. Related Wiegthed

$$L = \frac{1}{n} \left[\sum_{i=1}^n (AW_i / W_i) \right]$$

In the equation 2, AW_i is a vector acquired by the multiplication of the pair-wise comparison matrix of indices in the W_i vector (the vector of weight or coefficient of importance of indices). Surveying consistency of judgments in matrixes of pair wise comparison of indices reveals that consistency in judgments has been met (Equation 3).

Equation 3. Inconsistency Coefficient

$$C.R = \frac{C.I}{R.I} < 0.1$$

On this basis and after determining the hierarchy of the applied indices, the estimation of the degree of consistency of the pair-wise comparison matrix of indices and related judgments is done. So, the quantities of AW and L are obtained using the equation 2 and table 7 as follows:

Table 7. Aw Matrix and L Calculation

$$Aw = \begin{bmatrix} 1 & 1/2 & 3 & 7 & 5 & 4 & 2 \\ 2 & 1 & 4 & 8 & 7 & 5 & 3 \\ 1/3 & 1/4 & 1 & 4 & 3 & 2 & 1/2 \\ 1/7 & 1/8 & 1/4 & 1 & 1/2 & 1/3 & 1/5 \\ 1/5 & 1/7 & 1/3 & 2 & 1 & 1/2 & 1/4 \\ 1/4 & 1/5 & 1/2 & 3 & 2 & 1 & 1/3 \\ 1/2 & 1/3 & 2 & 5 & 4 & 3 & 1 \end{bmatrix} \times \begin{bmatrix} 0.25 \\ 0.31 \\ 0.1 \\ 0.03 \\ 0.04 \\ 0.07 \\ 0.16 \end{bmatrix} = \begin{bmatrix} 1.71 \\ 2.56 \\ 0.72 \\ 0.2 \\ 0.3 \\ 0.46 \\ 1.1 \end{bmatrix}$$

$$I = \frac{1}{7} \left[\frac{1.71}{0.25} + \frac{2.56}{0.31} + \frac{0.72}{0.1} + \frac{0.2}{0.03} + \frac{0.3}{0.04} + \frac{0.46}{0.07} + \frac{1.1}{0.16} \right] = 7.13$$

The degree of consistency coefficient for Tehran-North freeway is less than 0.1 (it is 0.01). So, it can be said that the judgments are adequately consistent and the results are converged. Similar to the first step, the degree of consistency of judgments has been surveyed in the second step and the results have been confirmed.

Compilation of Strategies

Table 8. SWOT Matrix

Weaknesses (W)	Strengths (S)	SWOT	
<ul style="list-style-type: none"> - Destruction of forests and pastures North of Alborz to set up freeway (W1) -Fragility of plant and animal ecology South of Alborz (W2) -The lands with relatively high risk in Central and North Alborz (W3) 	<ul style="list-style-type: none"> -The climatic potential favoring tourism (S1) -The deterrent laws destroying environment (S2) -Proper soil depth North of Alborz (S3) 		
<ul style="list-style-type: none"> -Defining projects relating to increase in potential of plant and animal ecology with a special emphasis on South Alborz (W1-W2-O4) -Improvement of method for management of habitats (W1-W2-W3-O4) -Expansion of watershed management activities to revive environment (with more emphasis on South Alborz) (W2-O4) 	<ul style="list-style-type: none"> -Offering tourism services (S1-O2) -Giving priority to sustainable and job creation tourism projects (S1-O4) -Expansion and mobilization of transportation facilities such as light terminals, the service-welfare on-way facilities (S1-S2-O1) -Establishing forest and national parks in areas with high tourism attraction potential (S1-O1-O3) -Expansion of watershed management projects (with more emphasis on southern part (S3-O1) -Expansion of mechanized farming (S1-S3-O1-O4) 	<ul style="list-style-type: none"> -Possibility of earning an income with respect to expansion of transit role (O1) -Minimizing time of transportation from Mazandaran to Tehran (O2) -Promotion of recreational tourism (O3) -Possibilities of constructive and positive developments in the social and economic structures of cities lying on North Alborz (O4) 	Opportunities (O)
<ul style="list-style-type: none"> -Defining integrative managerial systems to control forests and pastures (W1-T1) -Preparing plans to standardize recreational-service facilities (W1-W2-W3-T1) -Getting ensured of correspondence of environmental and construction regulations with related disciplines -Promoting protection standard of four environmental zones (W1-T1-T3) 	<ul style="list-style-type: none"> -Compilation of policies to support tourism industry through identification of environmentally valuable regions (S1-T1) -Limited and controlled definition of entrance and exit converters of freeway (S2-T2-T3) -Using controlling tool to determine freeway Toll Collection (S2-T1) -Compiling rules and regulations on geographical proximities to minimize environmental pollutions (S1-S3-T1) 	<ul style="list-style-type: none"> -Defining environmental unfriendly economic projects (T1) -Building many links between freeway and the residential points around (T2) -Possibility for eruption of many traffic problems in case of failure to find proper location for activities on the margins of the freeway (T3) 	Threats (T)

In this part of the analysis, the matrix of Strengths, Weaknesses, Opportunities and Threats (SWOT) is used to compile strategies. The matrix is an important tool

for compilation of strategies. The strategy is gained by comparing opportunities and strengths, the Strengths-Opportunities (SO). Also, through comparing strengths and threats, a Strengths-Threats strategy can be produced, as comparing Weaknesses and Opportunities there will be the Weaknesses-Opportunities (WO) strategy and the Weaknesses and Threats, there will be the Weaknesses-Threats (WT) strategies. In the matrix two factors are compared with each other in each phase and the aim is not to distinguish the best strategy, rather determining enforceable strategies (Table 8).

Evaluation and Prioritizing the Strategies

We used internal and external factors evaluation matrixes and QSPM for Evaluation and prioritizing the strategies. The matrix of internal and external factors defines and evaluates the strengths and weakness and also opportunities and threats points of the Tehran-North freeway. After arranging the factors, with consideration of the opinion of 40 experts in the Delphi team, all weights and scores have been defined. Sum of final scores for each internal and external factors have been gained by multiplication of the average of weighted factors to its scores. Here, score 1 means main weakness, score 2 defines less weakness, score 3 shows strength points of current situation and score 4 means the most strengths points for each factor.

Table 9 shows all internal factors and table 10 represents external factors of final scores. The total score for Tehran-North freeway related to internal factors is 2.76 and for external factors is 2.42 which demonstrates the average status for it.

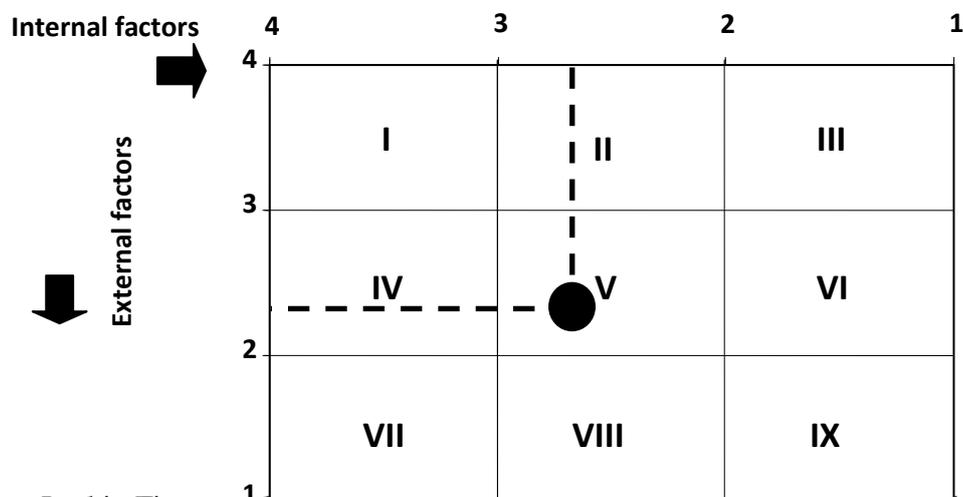
Table 9. *Internal Factors Evaluation Matrix*

Internal Factors		Weight	Score	Final Scores
Strengths	The climatic potential favoring tourism	0.2	1	0.2
	The deterrent laws destroying environment	0.07	2	0.14
	Proper soil depth North of Alborz	0.06	1	0.06
Weaknesses	Destruction of forests and pastures North of Alborz to set up freeway	0.25	3	0.75
	Fragility of plant and animal ecology South of Alborz	0.35	4	1.4
	The lands with relatively high risk in Central and North Alborz	0.07	3	0.21
Sum of final scores				2.76

Table 10. External Factors Evaluation Matrix

External Factors		Weight	Score	Final Scores
Opportunities	Possibility of earning an income with respect to expansion of transit role	0.13	1	0.13
	Minimizing time of transportation from Mazandaran to Tehran	0.08	2	0.16
	Promotion of recreational tourism	0.04	2	0.08
	Possibilities of constructive and positive developments in the social and economic structures of cities lying on North Alborz	0.08	2	0.16
Threats	Defining environmental unfriendly economic projects	0.55	3	1.65
	Building many links between freeway and the residential points around	0.07	2	0.14
	Possibility for eruption of many traffic problems in case of failure to find proper location for activities on the margins of the freeway	0.05	2	0.1
Sum of final scores				2.42

Based on Figure 5 which shows the division of IE matrix and tables 9 and 10, the best strategies can be selected.

Figure 5. Division of IE matrix for Tehran-North Freeway

In this Figure, cells I, II and IV have been named as removal and pick up strategies and cells VI, VIII and IX mean build and growth and cells III, V and VII demonstrate maintain and watch. As Figure 4 shows, according to the final score from the evaluation of the matrix of internal and external factors (2.76, 2.42), IE matrix for Tehran-North freeway placed at cell V. Hence it may be inferred that, the Tehran-North freeway must be focused on the maintenance and watch strategies. So, after compiling strategies of Tehran-North freeway by using SWOT matrix, the W-O strategies would be evaluated and prioritized by using QSPM.

The main steps of prioritizing strategies are given in following six stages:

- Opportunities, threats, strengths and weaknesses are written in the right column of QSPM.
- Weighting each in terms of internal and external factors.
- Selected Strategies in SWOT matrix are written in the top row of QSPM.
- Attractiveness scores are determined. The attractiveness scores determine interest rate of each strategy in a series of strategies. In the scores, number one shows none-interest, number two shows some interests, number three represents reasonable interest and number four is representative of very attractive.
- Total attractiveness scores are calculated by multiplying the stage two in the stage four.
- Final scores are calculated which show the strategy is the most preferred.

At this stage the Delphi team was asked to judge and to use the QSPM for evaluating and prioritizing the three chosen strategies. At first, all weights and scores were defined. Then the sum of factors was calculated. The results are given in table 11, respectively.

Table 11 shows the final results of the prioritized strategies and table 12 shows the rankings. The most important strategy for Tehran-North freeway is defining projects relating to increase in potential of plant and animal ecology with a special emphasis on south Alborz.

Table 11. *Tehran-North freeway QSPM*

Key factors		Weight	Strategy no.1		Strategy no.2		Strategy no.3	
			Score	Scores sum	Score	Scores sum	Score	Scores sum
Opportunities	Possibility of earning an income with respect to expansion of transit role	0.065	1	0.065	1	0.065	1	0.065
	Minimizing time of transportation from Mazandaran to Tehran	0.04	1	0.04	1	0.04	1	0.04
	Promotion of recreational tourism	0.02	2	0.04	3	0.06	2	0.04
	Possibilities of constructive and positive developments in the social and economic structures of cities lying on North Alborz	0.04	2	0.08	1	0.04	2	0.08
Threats	Defining environmental unfriendly economic projects	0.275	3	0.825	1	0.275	2	0.55
	Building many links between highway and the residential points around	0.035	2	0.07	1	0.035	2	0.07
	Possibility for eruption of many traffic problems in case of failure to find proper location for activities on the margins of the highway	0.025	2	0.05	1	0.025	2	0.05
Strengths	The climatic potential favoring tourism	0.1	3	0.3	2	0.2	2	0.2
	The deterrent laws destroying environment	0.035	2	0.07	2	0.07	2	0.07
	Proper soil depth North of Alborz	0.03	1	0.03	1	0.03	1	0.03
Weakness	Destruction of forests and pastures North of Alborz to set up highway	0.125	3	0.375	3	0.375	3	0.375
	Fragility of plant and animal ecology South of Alborz	0.175	3	0.525	2	0.35	4	0.7
	The lands with relatively high risk in Central and Northern Alborz	0.035	1	0.035	1	0.035	3	0.105
Sum of factors				2.505		1.600		2.375

Table 12. Strategies Ranking

Rank	Strategies
1	Defining projects relating to increase in potential of plant and animal ecology with a special emphasis on south Alborz
3	Improvement of method for management of habitats
2	Expansion of watershed management activities to revive environment (with more emphasis on south Alborz)

Conclusion

This paper presents an integrated model as a proposed methodology to evaluate vulnerability of trio zones of Alborz Mountains based on Tehran-North freeway construction and also compiles and prioritizes strategies for Tehran-North freeway strategic planning. The proposed methodology has potential to be utilized in other types of urban and regional strategic planning.

In this paper, the AHP model was used for the evaluation of trio Alborz zones vulnerability. It became clear that the south Alborz zone is distinguished as one of the most fragile environmental zones. Thus, it should be given the first priority in terms of management and control of the natural resources. Moreover, the north Alborz should be given the second priority in terms of protecting forests and coastal lands from destruction. Managerial mechanisms should be used to control coastal and forest lands. Eventually, the central Alborz zone should be given the priority to protect the wildlife and animal ecology. As a general finding, the Delphi team considered internal factors to be more important than external factors in making their decisions related to Tehran-North freeway.

The best strategies for monitoring and reducing impacts of Tehran-North freeway construction were compiled by SWOT matrix and finally these strategies were prioritized by QSPM model. Identifying the strengths, weaknesses, opportunities and threats by the SWOT matrix would help decision makers have more complete insight on the issue under assessment. It will also help in compiling strategies in the following phases with more care. The outcome of the article would help planners and managers be more capable of implementation and managing impacts of Tehran-North freeway construction and empower them to multidimensional decision making on economic, environmental and transportation domains.

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