Adolescents Leaving Parental Home: Psychosocial Correlates and Implications for Conservation

Li An
Angela G. Mertig
Jianguo Liu
Michigan State University

To disclose the interplay between psychosocial antecedents of adolescents' decisions to leave their parental home in an ecologically sensitive region, we used structural equation modeling to analyze data from in-person interviews of members of 220 households in Wolong Nature Reserve for giant pandas (China). We further divided our data into two sub-samples by gender to test the hypothesis that model parameters differ for females and males. Our findings indicate that parental attitudes/behavior, peer behavior, and perceived availability of material/non-material resources play a critical role in adolescents' home-leaving decisions. This study demonstrates an important link between psychosocial factors and biodiversity conservation.

KEY WORDS: leaving parental home; Structural Equations Modeling; giant panda (*Ailuropoda melanoleuca*); conservation; Wolong Nature Reserve (China).

INTRODUCTION

Adolescents leaving their parental homes has been viewed as a normal and natural phenomenon in Western societies (Baanders, 1996), as it signifies economic independence, personal responsibility, and emotional separation from parents (Goldscheieder & DaVanzo, 1985, Moore & Hotch,

Please address correspondence to Li An, Department of Fisheries and Wildlife, Michigan State University, 13 Natural Resources Building, East Lansing, MI 48824-1222; e-mail: anli@msu.edu.

1983, Stattin & Magnusson, 1996). Many studies of relevance to adolescents' decisions to leave their homes in Western societies have focused on general demographic trends (Mitchell et al., 1989), descriptions of the reasons for leaving one's parental home (Gierveld et al., 1991, Jones, 1995), timing of leaving one's parental home (Goldscheider & Goldscheider, 1993, Cooney & Mortimer, 1999), perceived consequences and social norms (Sebald, 1986), and distinct behavioral patterns related to gender, social class, race, ethnic origin, religious affiliation, and family structure (Goldscheider & Goldscheider, 1993, 1998, Cooney & Mortimer, 1999). However, the psychological causes and effects of leaving one's parental home, and especially their interplay, have seldom been quantitatively addressed (Mitchell et al., 1989). For instance, Gecas and Seff (1990) pointed out that most of the research on new household formation by adolescents was nontheoretical, descriptive, and explanatory, hence lacking rigorous models.

The paucity of rigorous models regarding adolescents' decisions to leave their parental home—especially within the context of a developing country—coupled with a need to understand how these decisions impact resource conservation issues, has prompted this particular study. Wolong Nature Reserve (Figure 1), a prized panda reserve in China with observable conflicts between development and conversation goals, provides us an excellent site to address these concerns. Designated in 1963 with an area of 200 km^2 and expanded to 2,000 km^2 in 1975, Wolong Nature Reserve (Figure 1) is one of the largest reserves in China for conserving the giant panda (*Ailuropoda melanoleuca*), a national treasure of China and a pressing concern to people around the world. As a "flagship" reserve in China, Wolong has drawn domestic and international attention (Liu et al., 2001), garnering substantial governmental investment in and support for panda breeding/nursing research, anti-poaching patrolling, and commercial logging prohibitions. In addition, it has gained extensive technical and financial support from international organizations such as the World Wildlife Fund (Reid and Jien, 1999, World Wildlife Fund, 2001). Despite all these efforts, the past two decades have nonetheless witnessed a substantial decline in the reserve's panda population from 145 animals in 1974 (Giant Panda Expedition, 1974, Schaller, 1985) to 72 in 1986 (China's Ministry of Forestry and World Wildlife Fund, 1989). This decline in the panda population has been at least partially attributed to serious habitat degradation, which is believed to result from forest loss and fragmentation because forests are a critical component of panda habitat, providing food (i.e., bamboo), shelter, and cover (Schaller et al., 1985). Unlike many nature reserves, particularly those in the developed world, Wolong has a resident human population. Notably, there has been a continued increase in annual

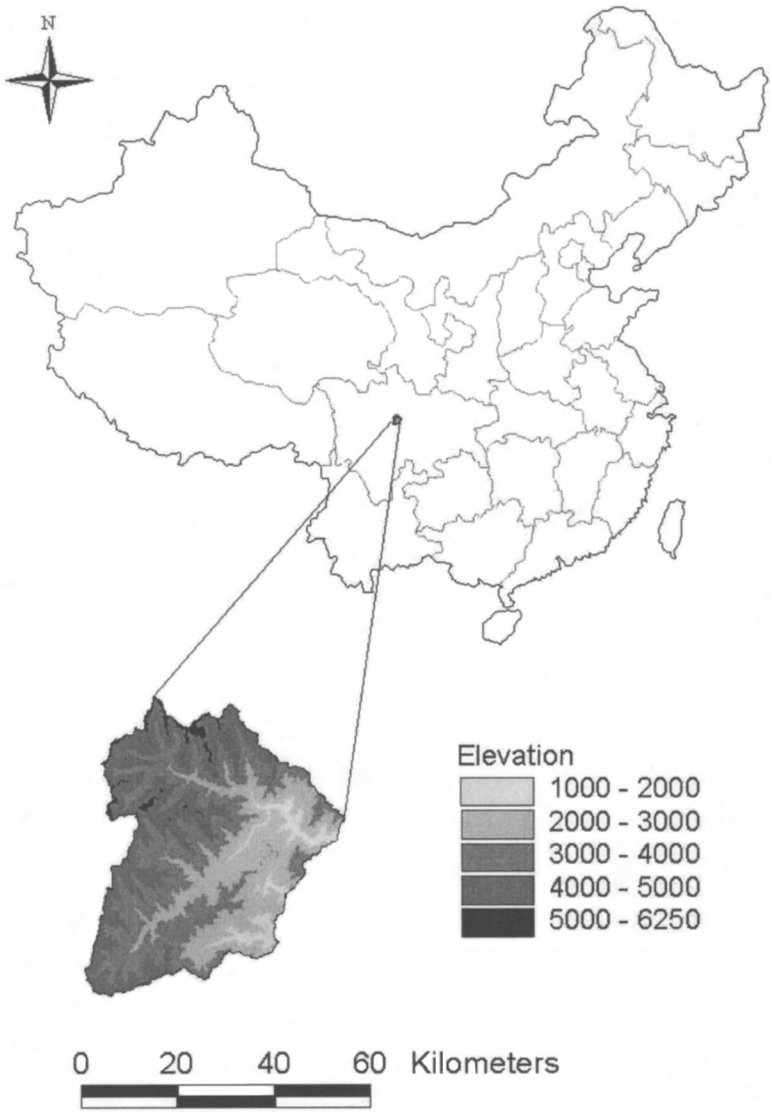

FIGURE 1. The location and elevation (meters) of Wolong Nature Reserve in the People's Republic of China.

human fuelwood consumption in the reserve (from 4,000 m^3 in 1975 to 10,000 m^3 in 1998), accounting for most of the reduction of more than 20,000 ha of panda habitat in the past two decades (Liu et al., 1999a).

Paralleling this trend is an increase in human population in the reserve from 2,560 to 4,320 (a 69% increase) and an even more rapid escalation in the number of households from 421 to 942 (a 124% increase) between 1975 and 1998 (Liu et al., 1999a). The population increase can be explained by the fact that the famous "one child policy" does not apply to minority ethnic groups such as Tibetans, who make up the majority of reserve residents (Liu et al., 2001). The even greater rate of household increase, however, is due to the fact that young people in Wolong are now more likely to establish their own households, rather than live with their parents and grandparents under one roof, which in previous generations was a traditional norm in China (Wang, 2000, Liu et al., 2001). Even though it is reported that the past two decades have seen increasing temporary migration and even some inter-provincial (to coastal regions in particular) migration in China (e.g., Liang, 2001), the household registration system (known as Hukou) still exerts strict control on household migration, especially in undeveloped rural areas (e.g., Wu 1994, Wong & Huen 1998, Fan, 1999) like Wolong Nature Reserve, where the only major legal way for immigration is through marrying the people in Wolong. Though it is documented that some young adults from rural areas go to cities for temporary jobs (Xu & Tan, 2002), most of them remain in rural areas, relying on the land and local resources. This is also true for residents in Wolong, due to not only limitations imposed by the household registration system, but also other socioeconomic factors such as low levels of education and lack of technical skills to seek jobs outside the reserve (Liu et al., 2001).

These situations have made immigration and emigration inconsequential factors in determining household dynamics. Household division and formation within Wolong, rather than migration, is more relevant to household dynamics, which directly determines the demand for resources. Most households within the reserve live a rural lifestyle, characterized by growing corn, potatoes, and vegetables for subsistence, and using fuelwood as their energy source for cooking food (both for humans and pigs) and heating (An et al., 2001). Electricity is available across the reserve, but it is primarily used for lighting and some electronic appliances due to its relatively high price and inconsistent quality (An et al., 2002). Per capita consumption of resources is higher in smaller households than in larger households (Liu et al., 2003). Given this lifestyle (energy use pattern in particular) and pattern of household dynamics, the increase in the number of households due to household division and formation in Wolong should be of more concern

to conservation biologists than population size per se. It is the issue of resource use that links home leaving decisions and panda habitat conservation in the reserve.

Our goal was to quantitatively explain the behavior of adolescents' leaving their parental home using psychological, social, and demographic data. By understanding the process of new household formation, we will obtain three important types of information. First, we will gain insights into the psychosocial antecedents of leaving the parental home in an Eastern culture, especially in a Chinese rural area, where the population is mostly composed of minority groups (Tibetans comprise approximately 75% of the reserve population, Liu et al., 1999b). With counterpart studies available in Western societies (e.g., Sebald, 1986, Glick & Lin, 1986, Gierveld et al., 1991, Goldscheider & Goldscheider, 1993, Cooney & Mortimer, 1999), these insights may facilitate comparative studies on this topic. Second, our research could help local reserve managers find a socially acceptable and ecologically sound approach to controlling the increasing rate of household formation, thus reducing the habitat degradation caused by an increasing demand for household fuelwood. Finally, our research, characterized by using structural equation modeling with social survey data (see descriptions in the Methods section), will provide an innovative approach to studying the interrelationships between human population and the environment.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

A wealth of studies has shown that parents and peers, the most salient groups from whom adolescents learn norms and values, play a critical role in shaping adolescents' attitudes and influencing their final decisions (e.g., Britain, 1963, Larson, 1972, Montemayor, 1982, Sebald, 1986, Cooney & Mortimer, 1999). Although it is reported that these two groups (parents and peers) hold different and even confronting opinions on some issues (e.g., Bronfenbrenner, 1981), many researchers tend to agree that young people turn to different groups for different issues, questions, and needs. Indeed, parents and peers are complementary to each other, often referred to as "dual reference groups" (Montemayor, 1982, Sebald, 1986). Specifically, on the issue of leaving the parental home, research has shown that parents and peers have significant impacts on adolescents' decision-making process (Goldscheider & DaVanzo, 1985, Goldscheider & Goldscheider, 1993).

Aside from those with whom adolescents discuss leaving home, the phenomenon itself has been marked by a continual decrease in the average

age at which adolescents choose to leave the home in both the United States (Goldscheider & DaVanzo, 1985, Goldscheider & Goldscheider, 1993) and Europe (Westoff, 1983, Van de Kaa, 1987, Gierveld, 1991). This trend towards younger ages has been attributed to a number of factors, all of which parallel economic growth: the "decline in traditional and religious authority," "universal education/employment of both genders," a culture focused on "personal gratification maximization," and "desire for autonomy, privacy, and independence" (Gierveld, 1991). It has also been observed that some adult children never even leave their parental home or later return home due to financial problems, unemployment, a sense of loneliness or isolation, and intense guilt over abandoning their parents (Clemens & Axelson, 1985, Goldscheider et al., 1999). Just as adolescents have reasons why they choose to leave or stay, so do the parents have reasons for promoting or discouraging leaving the parental home. Specifically, some parents encourage their children to remain/come home, even using "guilt producing" tactics. Adult children who live with their parents, termed "fledging adults" by Langway (1980), have both negative and positive influences on their parents and themselves. Positive influences include "more communication," "assistance in household maintenance," and "emotional closeness or companionship." Negative effects, which have seemingly drawn more attention, involve "parents' continuation to act in caretaking roles," "fledglings' continued behavior in immature and dependent ways," "deprivation of parents' freedom that they experienced before their children were born and which they are delighted to rediscover," "prevention from developing further interests," "inability to evaluate their marital relationship and resolve issues which may have been on the back burner," and so on (Clemens & Axelson, 1985).

Previous research has shown that individualism and autonomy are important psychosocial requisites, which can explain the "myself orientation" (Sebald, 1986) in many social activities such as career selection. Specifically, these requisites represent one of the major reasons for leaving the parental home (Gierveld et al., 1991). It has been noted that the decision to leave the parental home and its timing depend on many related issues as well, not solely on adolescents' (or parental) preferences. For instance, Blank and Torrechilla (1998) reported that the extended living arrangements (e.g., living with their parents or relatives within one home) among Latino immigrants in the USA result from their utilization of the elderly to care for young children, and sometimes their perceived responsibility to take care of the elderly who can no longer reside alone. Parental resources have also been found to be influential in determining adolescent choices. Gierveld et al. (1991) have classified parental resources into four categories:

(1) transferable material resources—economic capital, e.g., money, property; (2) transferable non-material resources—parents' education, cultural and social capital; (3) non-transferable material resources—parents' taking care of house chores, supply and preparation of meals; and (4) non-transferable non-material resources—intra-family care, understanding, and community. Their research showed that transferable resources (categories 1 and 2) tend to hasten adolescents' decisions of leaving the parental home, while the non-transferable resources (categories 3 and 4) tend to delay their decisions.

There have been only a few studies on leaving the parental home within China. Current research suggests that the traditional lifestyle of many generations living under one roof has been declining (Wang, 2000, Liu et al., 2001), as the younger generations increasingly desire to have their own households. This desire has been seen as a challenge to parental authority, which is a traditional component of Confucian family ideology (Wang, 2000). Other research indicates that young Chinese adults are now more influenced by peer groups than by parents (China Adolescence Development Foundation, 1992). However, since research specific to China is so limited and what has been conducted shows growing similarities to the situation in more developed countries, our conceptual framework (Figure 2) is based primarily on findings from Western countries.

Utilizing an important insight from the theory of Reasoned Action (Fishbein & Ajzen, 1975), namely that specific behavioral intentions are best predicted by attitudes germane to the behavior in question, our framework hypothesizes a direct link between a person's attitudes toward leaving the parental home and their intentions to do so. Prior research on the significant role of the "dual reference groups" suggests that parental behaviors, parental attitudes, peer behaviors, and peer attitudes should all have an impact on one's attitudes as well (this is similar to the notion of the subjective norm in the theory of Reasoned Action). Parents as well as peers influence how adolescents prioritize between two competing desires: the desire for privacy and autonomy on the one hand and the desire for companionship on the other hand (Gierveld et al., 1991). In this case, we also assert that parents' behavior and attitudes play a direct role in influencing behavioral intention. The lack of direct relationships between peers' attitudes and behaviors and the intention of leaving home in our model is due to important qualitative observations of the local situation being studied. Specifically, personal communication with local people indicated that they would not turn to peers for advice before making decisions. If a person suggests that another person leave his/her parental home or not, it is viewed as "meddling in other people's affairs" and thus "impolite." This is not to deny

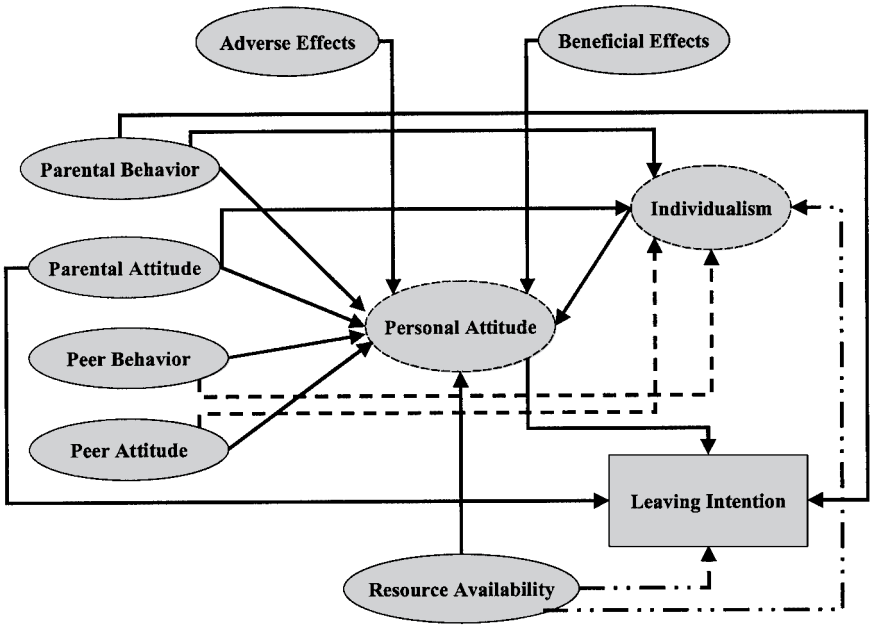

FIGURE 2. Conceptual framework.

Notes: The solid ovals are exogenous latent variables, and the dashed ovals are endogenous variables. Ovals at the start point of the arrow represent causes, and ovals at the end point of the arrow represent effects. The square box represents the ultimate endogenous latent variable. The indicators for the constructs are excluded for clearer illustration. The solid arrows are relationships to be tested in hypothesis 1. The dashed arrows in conjunction with the solid arrows apply to hypothesis 2. The dashed arrows with double dots between, in conjunction with the solid arrows, apply to hypothesis 3. A combination of all arrows constitutes hypothesis 4.

the influence of peers. These sorts of influences are considered to affect a person indirectly through the mediator of personal attitude.

We hypothesized that besides being directly impacted by the four antecedents mentioned above, adolescents' personal attitudes towards home-leaving behavior are impacted by a mediating psychological tendency, individualism. This accounts for a person's psychological demand for individualism and autonomy as suggested by Gierveld et al. (1991) and Sebald (1986). This tendency toward individualism, formed and developed primarily at childhood, is in turn treated as a function of parents' behavior and attitudes. However, it may also be plausible that this tendency is jointly

dependent on the behaviors and opinions of one's peers, indicated in hypothesis 2 below.

To account for the influence of parental resources as suggested by Gierveld et al. (1991), we hypothesized a direct effect of the perceived availability of transferable material resources (here: "Resource Availability") and of the perceived availability of transferable non-material resources (here: "Beneficial Effects") on attitudes toward leaving home. Likewise, we hypothesized a direct (albeit negative) effect of non-transferable resources (both material and non-material; here: "Adverse Effects") on personal attitudes.

Our hypothesis 1 is directly based on the above conceptual framework, represented by the ovals, the box (latent variables), and the solid arrows connecting them (Figure 2). This hypothesis states that (1) a person's intention to leave the parental home is jointly determined by his/her personal attitude, attitude of his/her parents, and behavior of his/her parents. (2) Personal attitude toward leaving the parental home is impacted by parental behavior, parental attitudes, peer behavior, peer attitude, his/her personal tendency toward individualism, the perceived adverse and beneficial effects of leaving the parental home, and his/her perceived availability of resources. (3) A person's tendency toward individualism is influenced by his/her parents' behavior and attitude as well.

Research on leaving the parental home in Western countries has shown that a person seeking autonomy and independence often turns to his/her peers for reference and support (Sebald, 1986). Thus it may be reasonable to expect the tendency toward individualism to also be impacted by peers' attitude and behavior. The combination of these two relationships and the relationships stated in hypothesis 1 constitute our hypothesis 2. In our conceptual framework, these two additional relationships are represented by the two dashed arrows from peer behavior and peer attitude to individualism.

In order to further test the importance of transferable material resources in hastening the behavior of leaving one's parental home (Gierveld, 1991), we hypothesized that resource availability (i.e., transferable material resources) exerts a positive direct impact on the intention of leaving the parental home. In addition, we were also interested in testing whether perceived resource availability would have a direct impact on the tendency toward individualism, as it is believed in Chinese culture that hardships (including scarcity in material resources) accelerate the growth of a person's independence and maturity. Thus we developed a relationship from resource availability to individualism. These two relationships (dashed arrows

with double dots between in Figure 2), together with the relationships mentioned in hypothesis 1 (solid arrows), form our hypothesis 3. Our last hypothesis (hypothesis 4) is a combination of all three hypotheses, representing an overall test of all of the aforementioned relationships.

In addition to the above hypotheses, we were interested in assessing whether one's gender makes a difference in determining how our conceptual framework works. It is well documented that males and females have different roles and behavior patterns in a number of social activities (e.g., Gierveld et al., 1991, Glick & Lin, 1986). For instance, males have traditionally been less parentally oriented than females, although this has recently been challenged by some researchers (e.g., Sebald, 1986), who have suggested that a trend of overall rejection of traditional gender stereotypes may account for an increasingly androgynous pattern in the decision-making of adolescents (e.g., Hughes & Gove, 1981). In order to address the possible gender-induced distinctions in our conceptual framework, we also ran separate analyses by gender.

METHODS

Survey Sample

We used in-person interviews to elicit the data needed for addressing the issue of leaving one's parental home. Local people's low educational levels (4.2 years of schooling per person, see An et al., 2002) and the inconvenient postal services made other survey modes untenable. Our sampling frame was the 1996 Agricultural Census list (Wolong Nature Reserve, 1996), which lists all households by villages (a village is a cluster of households that are geographically close to one another, and the reserve contains six such villages). In order to obtain insights into local people's concerns on this issue and develop our questionnaire, in the summer of 1999 we randomly selected 20 households and conducted pilot interviews. We asked the household heads a few open-ended questions regarding their own and their parents' attitudes towards this issue, perceived beneficial and adverse consequences, their perception of the appropriate time for leaving one's parental home, and so on. Having completed pilot interviews, we developed a more structured interview schedule for the next set of interviews. We used stratified sampling to select 220 households by proportionally drawing from each of the six villages based on its size (N_i, $i = 1, 2, \ldots, 6$). Specifically, within village i, we coded all the households with numbers from 1 to N_i, and then randomly sampled n_I (the sample size in village i)

households from a total of N_i households in village i. Using this sampling procedure, we designated 220 out of the 942 households for interviews (approximately 23% of all the households in Wolong) during May–August of 1999. The sample size reflects the tradeoff between the limitations of our resources (i.e., time, money, and manpower) and the need for a relatively large sample. A large sample is important in Structural Equation Modeling because it is based on large-sample distribution theory (Raykov & Widaman, 1995, Jöreskog & Sörbom, 1996b). Within each selected household we chose an unmarried adult (18 years of age or older), if one was available. The reasons for this were: (1) only unmarried adolescents would have to decide whether or not to leave their parental home in the future; (2) 18 is usually the age at which people finish high school and take on full civil/criminal responsibilities in society under Chinese law. If household "A" did not have an unmarried 18+ year-old member, we switched to another household that did, household "B"—one member of which should be a child or sibling of the head (or his/her spouse) of household "A." Therefore, the 220 households could be classified into a subset where all the households had qualified young adolescents (hereafter called "direct group"), and another subset (comprised of household B's) in which siblings/children of the household heads (or their spouses) who lived independently were interviewed instead (hereafter referred to as "indirect group").

Interviews

Before each interview session started, we briefly explained to the interviewee who we were, the purpose of our research, how they had been selected, the estimated time of the interview, the confidentiality of the interview results, and the voluntary nature of the interview session. We interviewed a total of 220 young people, coming from both the direct and indirect groups. We had a 100% compliance rate in these interview sessions. This rate should not be surprising among residents of rural China where people usually enjoy being visited. Out of these 220 interviews, 203 had complete information on all of the variables and were used in our analysis.

Measures

Structural Equation Modeling (SEM) has been widely used in the social sciences (such as sociology and psychology) to study complex interdependent relationships between different latent variables, characterized by the fact that a latent variable can be both exogenous and endogenous in different equations (Bollen, 1989). A latent variable (also called construct) can

be represented and measured by a number of indicators, i.e., questions designed to capture different aspects of the specific construct. Our constructs in the conceptual framework (Figure 2) were measured using corresponding indicators, as listed in Table 1. While using multiple indicators for latent constructs increases the likelihood of achieving reliable conclusions (e.g., Bollen, 1989, Raykov & Widaman, 1995, Jöreskog & Sörbom, 1996b), in some situations it is not always possible to measure several indicators for each latent construct. In the absence of multiple indicators, SEM allows the researcher to use a single indicator and constrain its error variance to be zero to facilitate analysis (Mels, 2002, personal communication; Dr. Gerhard Mels is a senior programmer of LISREL and works as technical support in Scientific Software International, Inc.). This has been commonly used in practice, especially when the constructs to be measured deal with behaviors or intentions (e.g., Putte & Hoogstraten, 1997), since the margin of error in answering such questions should be very small. In some cases where we use multiple indicators, error variances were constrained to be zero since the original model resulted in a negative error variance. We used 2–3 indicators for each of our latent constructs except for three constructs related to a person's leaving intention and parental/peer behavior, where one indicator was used for each and the error variance was forced to be zero; the associated R squared would accordingly be 1 (Jöreskog & Sörbom, 1996c). The reliability of each indicator (without a constrained error variance) was measured by an index of R squared, ranging from 0 (unreliable) to 1(perfectly reliable). Below are measures of all constructs in our conceptual framework (Figure 2).

Table 1 lists our measures for the constructs in Figure 2. Some additional information not included in Table 1 is provided here in relation to the following constructs. (1) *Parental Behavior*: We used one dichotomous indicator to measure whether the interviewee's parents were living or had ever lived (if their grandparents were dead at the time of our interview) with their grandparent(s). We coded those answers indicating their grandparent's partial/seasonal stay with their parents (e.g., the siblings of their parents take turns caring for the grandparents) as "Yes." (2) *Peer Behavior:* We asked the interviewee to list four good friends and/or relatives whose opinions (regarding social activities) he/she most respected, and coded them as A, B, C, and D. Then we asked him/her whether each of these four friends was living (or had lived with, if the parent(s) died prior to our interview) with his/her parent(s). Those answers indicating partial/seasonal stay with their parents (e.g., the siblings take turns caring for their parents) were coded as "Yes." (3) *Resource Availability*: Our pilot interviews indicated that local people were very much concerned with land and wood because of the

TABLE 1

Latent Variables and Their Indicators

Constructs	Indicators/Question Wording	Coding	R^2
Parental Behavior	Do/did your parents live with your grandparent(s)/ when they were alive?	0-No; 1-Yes.	1
Parental Attitude	Do your parents agree with: "Children should leave the parental home after they grow up"?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.85
	Do your parents agree with the following idea: "At least one child should live with his/her parents"?	1-strongly agree, 3-unsure, 5-strongly disagree.	1
Peer Behavior	List four of your closest friends or relatives whose opinions you respect (names not needed). Does/did he/she live with his/her parents?	1 for no, 0 for yes. peer behavior = sum of answers for the four.	1
Peer Attitude	Do your good friends think that a person should live independently when he/she grows up?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.497
	Do the people around you favor leaving parental home after getting married?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.507
	Do your relatives encourage you to leave your parental home when you are old enough?	1-strongly agree, 3-unsure, 5-strongly disagree.	0.335
Resource Availability	I think it is __ to obtain land to build a new house if I want to	1-very hard, 3-unsure, 5-very easy.	0.337
	I think it is __ to obtain enough wood to build a new house if I want to	1-very hard, 3-unsure, 5-very easy.	0.605
Adverse Effects	How often do you think a person would feel loneliness/lack of communication with his/her parents when leaving parental home?	1-never, 2-less often, 3-as before, 4- more often, 5- all the time.	0.451
	How often do you think a person would feel difficult to handle the housework without his/her parents' help?	Same as above.	0.351
Beneficial Effects	Do you agree with the statement: "a person will feel more independence/less control from parents if he/she lives independently"?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.717
	What do you think: "a person will be able to spend __ money on recreation activities if he/she lives independently"?	1-much less, 3-the same, 5-much more.	0.331

TABLE 1 (*Continued*)

Constructs	Indicators/Question Wording	Coding	R^2
	What do you think: "a person will be able to spend __ time on recreation activities if he/she lives independently"?	1-much less, 3-the same, 5-much more.	0.671
Individualism	Do you agree: "I enjoy making household economic decisions (e.g., what crops to grow, find a temporary job in cities) by myself"?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.288
	Do you agree: "I want to do whatever I view appropriate without having to listen to my parents"?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.576
Personal Attitude	Do you agree: "Living separately is in general worse than living with parents because a person has to deal with many things he/she has not dealt with before"?	1-strongly agree, 3-unsure, 5-strongly disagree.	1
	Do you agree: "Living separately would make a person have the feeling of more maturity and freedom"?	1-strongly disagree, 3-unsure, 5-strongly agree.	0.744
Leaving Intention	"How likely would you leave your parental home and set up your own home in the future (e.g., after marriage)?"	1-never, 2-not so likely, 3-likely, 4-very likely, 5-for sure.	1

Note: To save space in the table, only three levels (1, 3, and 5) in the Likert scale are listed.

reserve's policy of restricting acquisition of additional materials for new home construction. Interestingly, money was not given as high a priority as we had expected. This is probably due to the fact that local residents mostly rely on locally available materials (stones and wood) for construction and neighbors' manpower through labor exchange with little or no cash payment. They only spend a limited amount of money buying construction materials such as tiles and electric meters, which cannot be produced by themselves. Therefore, we focused on measuring the availability of land and wood for this construct.

In relation to *Adverse Effects*, emotional closeness and ease of housework have been reported as important reasons for choosing to live with parents (e.g., Clemens & Axelson 1985, Gierveld et al., 1991). The findings in our pilot interviews corroborated this point of view. Loneliness/lack of intimacy with parents and increasing difficulty of housework (such as taking

care of children, feeding pigs) were described as the major adverse consequences of leaving one's parental home. With regard to the *Beneficial Effects*, our pilot interviews showed that young adults tend to associate "more independence/ autonomy" and "more time and money for recreation activities" with leaving the parental home.

Analyses

The analyses consisted of four steps. First, in order to verify the utility of our indicators, a confirmatory factor analysis (CFA) was conducted on the seven exogenous constructs. CFA, in contrast to exploratory factor analysis, is characterized by determining relationships between latent constructs and their corresponding indicators in advance (Bollen, 1989). Second, a CFA was performed on the three endogenous constructs. Third, starting from our hypotheses mentioned earlier, we tested structural equation models (SEM) under these hypotheses. Last, we sorted our pooled data into two groups for males and females and conducted multi-group analyses based on the best-fitting model in the third step above. We used SIMPLIS to test the SEMs in all the steps. In addition to conforming to the t rule (Bollen, 1989), the statistical identification of our models was substantiated by the fact that (1) the models all converged; (2) no negative error variances occurred (after constraining problematic error variances to zero); and (3) there were no standardized estimates that exceeded unity (Gerhard Mels, 2002, personal communication).

In addition to traditional goodness of fit indices such as chi-square and p-values, we used a number of new indices suggested by Raykov and Widaman (1995). Among these indices, root mean square error of approximation (RMSEA) is considered to be less dependent on sample size. Previous research found the expected cross-validation index (ECVI) to be an important index in comparing several *a priori* theoretical models (Raykov & Widaman 1995). In summary, in order to make decisions among alternative models, we jointly considered the behavior of the following two groups of indices in addition to the typical χ^2 and p-values: (1) Indices of model "badness": Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), Expected Cross-Validation Index (ECVI), Non-centrality Parameter (NCP), χ^2, and χ^2/df. The lower the values for these indices, the better the model fits the data. (2) Indices of model "goodness": p-value, Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI). The higher (closer to 1) the values for these indices, the better the model fits the data. For the definition of all these indices, see Jöreskog and Sörbom (1996b).

RESULTS

Our pilot interviews of 20 households showed that the perceived appropriate time for leaving the parental home was "after I get married," "after the first child is born," or "it depends on the number of siblings." The possible reasons for leaving the parental home were "less conflict with siblings," "more independence," or "we have to leave because of too many siblings." The possible reasons for not leaving the parental home were listed as "parents can help take care of our children," "it depends on the availability of land," "it depends on the availability of wood," "depends on parents," "children should look after parents," or "need to care about relations with siblings and parents." The beneficial consequences were deemed to be "freedom," "more harmonious relations," "more self reliance," or "more time and money for entertainment," while the adverse consequences were "lack of childcare," "trouble doing housework," "missing the parents," or "parents lacking care." The perceived attitudes of parents towards their children leaving the parental home were "it is a normal phenomenon, as a tree would have many branches when it grows up," "depends on children," or "at least one child should live with parents."

Of the 203 respondents whose data were used for statistical analysis, 82 (40.39%) were females and 121 (59.61%) were males. The average age of these respondents was 22.1 years, ranging from 18 to 35 with a standard deviation of 2.2 years.

CFA on Latent Variables

Overall the CFA on the seven exogenous constructs yielded a very good fit of the factor structure to the data. In terms of "badness" of fit, RMSEA = 0.031, RMR = 0.0631, ECVI = 0.815, NCP = 0.681, $\chi^2 = 66.681$, and $\chi^2/df = 1.191$ (df = 56, N = 203); in terms of goodness of fit, p = 0.156, GFI = 0.965, and AGFI = 0.934. The measurement model for exogenous constructs was deemed satisfactory for later analyses. The CFA on the three endogenous constructs yielded an even better overall fit: RMSEA = 0.000, RMR = 0.0135, ECVI = 0.129, NCP = 0.000, $\chi^2 = 1.643$ with, $\chi^2/df = 0.411$ (df = 4, N = 203); along with p = 0.801, GFI = 0.999, and AGFI = 0.998. As with the first CFA model, the second CFA model for endogenous constructs was considered excellent for later analyses. Based on these two measurement models, we continued our hypothesis testing using the relationships discussed earlier in the Conceptual Framework and Hypotheses section. The measurement models tested here were incorporated in the model tests below.

Hypothesis Tests

Our structural equation modeling resulted in the following overall goodness of fit indices for models under Hypotheses 1–4, as shown in Table 2. As suggested by Raykov and Widaman (1995), it is safe to fail to reject an *a priori* model when χ^2/df is less than 1.5, and RMSEA is less than 0.05. Considering these points, we rejected models 2 and 4, as they have large χ^2/df and RMSEA values. Models 1 and 3 are close in terms of GFI, AGFI, and RMR, but differ in terms of χ^2/df (less than 1.5 in model 3), RMSEA (less than 0.05 in model 3), and ECVI (1.533 in model 3 and 1.597 in model 1). In addition, model 3 has a χ^2 reduction of 12.868 with a loss of only 2 degrees of freedom in comparison with model 1, corresponding to an observed p value of 0.003. This indicates that the null hypothesis should be rejected in favor of the alternative—model 3 significantly improved the model fit compared to model 1. Bearing these facts in mind, we selected model 3 for further analysis regardless of model 3's relatively low p–value (0.002). Solely from the perspective of statistical acceptability of model-testing p–values in social science (greater than 0.05 or 0.01), even model 3 is not acceptable. But social scientists, especially when dealing with a large sample, rarely meet this standard because the null hypothesis being used tests how close the model is to the data. This is typically too rigid a standard with which to test a model's utility, as only slight variations between the model and the data can thereby lead to an overall rejection of the model. This is part of the reason to develop and use other model fit indices, as discussed in the Measures section (Bollen, 1989; Bollen and Long, 1993).

The following equations are used for model 3, where the coefficients a_i, b_i, and c_i are reported in Table 3.

$$\text{Individualism} = a_1 \times \text{Parental Behavior} + a_2 \times \text{Parental Attitude} + a_3 \times \text{Resource Availability}$$

$$\text{Personal Attitude} = b_1 \times \text{Parental Behavior} + b_2 \times \text{Parental Attitude} + b_3 \times \text{Peer Behavior} + b_4 \times \text{Peer Attitude} + b_5 \times \text{Resource Availability} + b6 \times \text{Adverse Effects} + b_7 \times \text{Beneficial Effects} + b8 \times \text{Individualism}$$

$$\text{Leaving Intention} = c_1 \times \text{Parental Behavior} + c_2 \times \text{Parental Attitude} + c_3 \times \text{Resource Availability} + c_4 \times \text{Personal Attitude}$$

Multi-Group Analysis

As discussed above, the multi-group analysis was based on structural equations established in model 3 (Figure 3). The results are shown in Table 4. The global (both groups as a whole) fit indices RMSEA, RMR, ECVI, and NCP, χ^2 (df), χ^2/df, and p–value (LISREL does not provide GFI and AGFI

TABLE 2

Goodness of Fit Indices of the Structural Equation Models (N = 203)*

Models	RMSEA	RMR	ECVI	NCP	χ^2(df)	χ^2/df	p-value	GFI	AGFI
1	0.050	0.066	1.597	59.566	176.566 (117)	1.509	0.000	0.952	0.922
2	0.084	0.063	2.122	165.616	282.616 (117)	2.416	0.000	0.957	0.931
3	0.046	0.062	1.533	48.698	163.698 (115)	1.423	0.002	0.958	0.930
4	0.057	0.062	1.692	75.809	189.809 (114)	1.665	0.000	0.958	0.930

Notes: RMSEA stands for Root Mean Square Error of Approximation, RMR for Root Mean square Residual, ECVI for Expected Cross-Validation Index, NCP for estimated Non-Centrality Parameter, GFI for Goodness of Fit Index, and AGFI for Adjusted Goodness of Fit Index. For details of these indices, see Jöreskog and Sörbom (1996b).

TABLE 3

Structural Relationships Under Hypothesis 3

	Endogenous Constructs		
	Individualism	Personal Attitude	Leaving Intention
Exogenous Constructs (Predictors)			
Parental Behavior	0.112 (1.847)	–0.020 (–0.303)	–0.153 (–2.035)*
Parental Attitude	0.461 (4.356)*	–0.144 (–0.915)	–0.802 (–4.772)*
Peer Behavior		0.008 (0.100)	
Peer Attitude		–0.196 (–1.553)	
Resource Availability	–0.581 (8.104)*	0.091 (0.609)	0.058 (0.359)
Adverse Effects		–0.321 (2.935)*	
Beneficial Effects		0.132 (1.616)	
Individualism		0.415 (6.735)*	
Personal Attitude			0.384 (5.268)*

Notes: The asterisks (*) represent significance at the 95% confidence level. The numbers in the cells are standardized coefficients; those in parentheses are t values.

for global comparisons in multi-group analysis) were 0.032, 0.101, 2.788, 26.607, 322.607 (296), 1.090, and 0.138 respectively. Based on our earlier discussions on goodness of fit indices, the model fits are acceptable.

DISCUSSION

In this section, we will first discuss the possible mechanisms underlying the directional relationships identified in model 3. This discussion will be centered on the three endogenous constructs: individualism tendency (also an exogenous construct in relation to the leaving intention), personal attitudes (also an exogenous construct in relation to leaving intention), and intention of leaving the parental home. Following this discussion will be our speculations on the gender-induced differences in the relationships.

Intention of Leaving the Parental Home

Personal attitude, as expected, has direct and significant positive impacts on the intention of leaving one's parental home. The more a person favors leaving the parental home, the stronger is one's intention to do so.

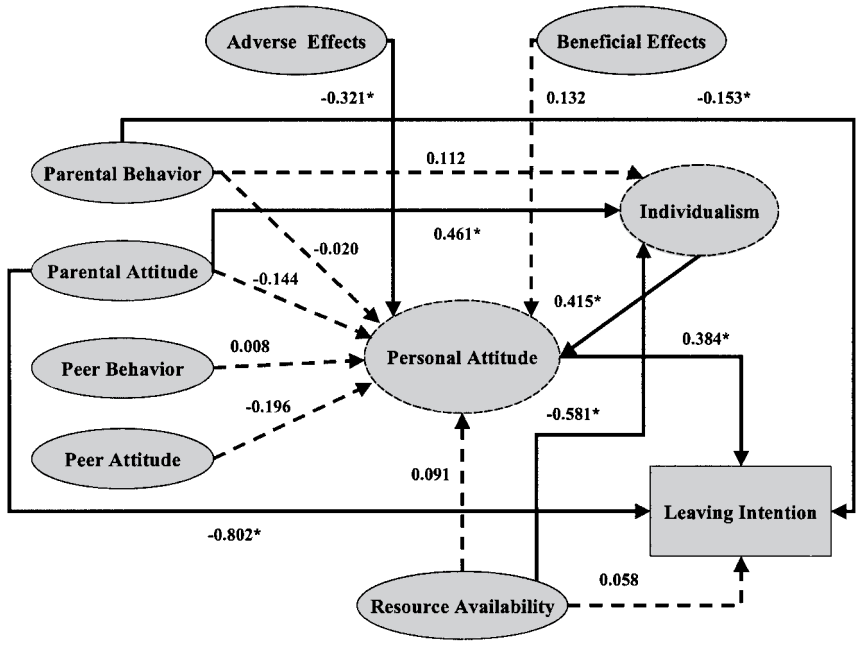

FIGURE 3. Illustration of the structural equations in hypothesis 3 (Model 3).

Notes: The solid arrows indicate relationships significant at the 95% confidence level, and the dashed arrows are insignificant at this level. The solid ovals indicate exogenous latent variables, and the dashed ovals represent endogenous latent variables. The square box represents the ultimate endogenous latent variable. The numbers are effect coefficients for the associated relationships. Asterisks represent significance at the 95% confidence level.

Most interestingly, parental attitude exerts a significant negative impact on a person's intention: the coefficient from parental attitude to this intention is –0.802; parental behavior exerts a positive impact on that intention even though the coefficient from parental behavior to this intention is –0.153 (parental behavior is coded in a reversed direction).

The reason for this negative relationship may be that these two generations hold opposite opinions on the issue of leaving the parental home. Surprisingly, it is the parents who are more supportive of their children leaving the parental home. On a scale of acceptance of children leaving home, ranging from 1 (strongly disagree) to 5 (strongly agree), parents registered an average score of 3.8, while adolescents averaged only 2.8. The following reasons could explain this phenomenon. First, Wolong is an undeveloped rural area in China with limited resources and few job opportunities. Within this context, young adults may be a little better off if they could reduce some daily expenses (e.g., for electricity) and labor (e.g., for

TABLE 4

Structural Relationships for Multi-Group Analysis

	Endogenous Constructs					
	Individualism		Personal Attitude		Leaving Intention	
	Males	Females	Males	Females	Males	Females
Exogenous Constructs (Predictors)						
Parental Behavior	0.070	0.153	0.303	–0.127	–0.148	–0.169
	(0.977)	(1.761)	(0.354)	(–1.273)	(–1.480)	(–1.424)
Parental Attitude	0.432*	0.206*	–0.300	0.052	–0.527*	–0.513*
	(6.053)	(2.423)	(–1.740)	(0.369)	(–5.387)	(–4.224)
Peer Behavior			0.214*	–0.239*		
			(2.566)	(–2.851)		
Peer Attitude			–0.252	–0.085		
			(–1.500)	(–0.709)		
Resource Availability	–0.402*	–1.061*	0.102	0.354	0.074	0.491*
	(–3.227)	(–5.493)	(0.429)	(1.419)	(0.462)	(2.619)
Adverse Effects			–0.116	–0.453*		
			(–0.686)	(–2.469)		
Beneficial Effects			0.066	0.174		
			(0.589)	(1.526)		
Individualism			0.570*	0.542*		
			(4.836)	(4.371)		
Personal Attitude					0.248*	0.454*
					(3.088)	(4.813)

Notes: Asterisks represent significance at the 95% confidence level. The numbers in the cells are standardized effect coefficients, and those in parentheses are t values.

collecting fuelwood) by staying with parents. Our previous research has shown that fuelwood consumption in a larger household is more efficient (Liu et al., unpublished data). Additionally, electricity expenses are a burden to local residents (An et al., 2001), and fuelwood collection has become increasingly difficult (Liu et al., 1999a). Under such conditions, it is natural for adolescents to slightly favor living with their parents while sacrificing some degree of autonomy. Second, many young couples indicated that it was very hard for them to handle housework (looking after children in particular) without assistance from parents. Lastly, from the parents' perspectives, they usually have many children (per couple) and may expect them to develop their own ways of making a living rather than being overly dependant on the parents.

The insignificant relationship between perceived resource availability and intention to leave the parental home, however, does not support what Gierveld et al. (1991) have found, i.e., that material resources would hasten the decision to leave the parental home. This lack of support could be related to two factors. First, property rights contribute in large part to the distinction. In Western societies, where private property rights have been legally defined and protected, properties such as land and houses can be inherited by children. In China, a farmer has only "rights of use" for the land he/she cultivates or occupies—and thus cannot sell or transfer it to other individuals, including family members. The wood on the associated land is similar to "common property," though Wolong has imposed some restrictions on harvesting wood (An et al., 2002). Under these conditions, a perceived high level of available resources may not be obtainable for future consumption. Lastly, even the households with the least amount of land assignments do not feel difficult to find enough land for building houses. Land was assigned to every household in the 1982 "land contracting and operation" reform (this reform was conducted in other rural areas of China a few years earlier, largely between 1978–1980) based on the household size at that time. Though household sizes may have changed since then, land for a typical household to build a few more houses may still be available and thus does not constitute a limiting factor. However, more insights may be obtained on this issue in our later multi-group analysis, in which the relationships between the intention and the perceived resource availability differ for males and females.

Individualism Tendency

As we expected, parental attitude has significant positive impact on the general psychological characteristic of individualism. In other words,

the more parents favor the behavior of their children's leaving the parental home or the more they encourage it, the more likely it is for a person to have a tendency towards individualism. Perceived resource availability also plays an important role in shaping a person's individualism, though conversely: the more material resources that are available, the less independent or individualistic a person will be. This negative relationship between resource availability and individualism is consistent with Chinese culture, as discussed earlier in the Conceptual Framework and Hypotheses section: hardship facilitates earlier independence and greater autonomy. The lack of abundant material resources (land and wood in particular) could trigger a person to work hard and seek alternative material resources (e.g., using bricks, if affordable, for house construction rather than timber) and alternative non-material resources (pursuit of higher educations and jobs outside Wolong).

Personal Attitude

Surprisingly, parental behavior and attitude do not exert direct significant impacts on personal attitudes towards leaving the parental home. Two reasons may account for this phenomenon. First, parental behavior and attitude impact their children primarily through shaping their children's psychological characters, such as a tendency towards individualism, as discussed earlier. The tendency thus formed has a more profound impact on their attitude towards a specific issue like leaving the parental home. This is reflected in the significant positive relationship from parental attitude to individualism (coefficient 0.461 with t value 4.356), and the positive relationship from individualism to personal attitude (coefficient 0.415 with a t value of 6.735). Second, as mentioned in the Conceptual Framework and Hypotheses section, young people in China have been increasingly challenging parental authority. This insignificant relationship between personal attitude and parental behavior/attitude could be a support for this conclusion. As to peers' impacts, we observed an insignificant relationship from peer behavior to personal attitude (coefficient 0.008 with t value of 0.100). But this relationship is significant in the multi-group analysis for both males and females and will be discussed later. The insignificant relationship from peer attitude to personal attitude (coefficient –0.196 with t value of –1.553) may signify that adolescents are concerned more about their own needs (as suggested by the significant relationship from individualism to personal attitude) and the deeds of their peers (there is a significant relationship from peer behavior to personal attitude in the forthcoming multi-group analysis), than what other people say.

The impact of perceived resource availability on personal attitude is weak, as indicated by the insignificant coefficient (0.091 with t = 0.609). This weakness can be understood from the perspective that as material resources provide conditions for some specific decision or behavior, they do not necessarily impact a person's attitudes or preferences directly. The negative relationship between adverse effects and personal attitude does provide support for Gierveld et al. (1991)'s findings, i.e., that non-transferable materials would impede the process of leaving the parental home. As listed in Table 1, the construct deals with loneliness/lack of intimacy and difficulty in handling housework, corresponding to non-transferable parental resources that were reported to slow down the decision to leave the parental home. The construct beneficial effects, measuring perceived independence and opportunities for more recreational activities in relation to the behavior of leaving the parental home, deals with a person's conformation to his/her surrounding environment and culture impacted by parents. Thus it could be viewed as a construct for transferable non-material resources, which should have been significantly positive (expediting the decision to leave the parental home) according to Gierveld et al. (1991). But it was found to be insignificant, with t = 1.616. A larger sample size may have caused this relationship to be statistically significant.

In accordance with our hypothesis that a greater tendency toward individualism would result in a greater intention to leave the parental home, there is a significant positive coefficient (0.415 with t = 6.735) from individualism tendency to personal attitude. Among all the significant relationships that are directed towards personal attitude, individualism tendency has the largest coefficient. Secondary to the tendency of individualism is adverse effects (–0.321, t = 2.935). Peer Attitudes (–0.196, t = –1.553) and beneficial effects (0.132, t = 1.616) are not significant at the 95% significance level, as we expected, but might have been so if a larger sample had been utilized. This suggests that a person's attitude towards leaving the parental home is primarily influenced by his/her own tendency toward individualism, but he/she also may have concerns about the effects (negative as well as positive) of this behavior.

Differences Resulting from Gender

Our multi-group analysis based on gender indicated that the coefficient (0.153) from parental behavior to individualism tendency in the female group was significant at the 90% level, while in the male group it was not. This significance suggests that women's individualism tendency is more impacted by parental behavior than is men's; this is typically reported

as a "traditional gender stereotype" (Sebald, 1986). Wolong's economy is still characterized by traditional farming-oriented activities. Only since the 1980s have local residents started to receive frequent infusions of both products (e.g., chemical fertilizers, pesticides) and information (e.g., job opportunities, better farming techniques) from the outside world (An et al., 2001). Men have more opportunities to receive higher education or go out for temporary jobs than women do (Liu Mingcong 2001, personal communication). This context may provide a reasonable explanation for this finding. Paralleling this traditional trend, women show more concern about material resources (a coefficient of 0.491 from resource availability to leaving intention, with $t = 2.619$), and are more careful about adverse consequences (a coefficient of –0.453 from adverse effects to personal attitude, with $t = -2.469$) when dealing with leaving the parental home.

Interestingly, personal attitude for men is significantly (at the 90% level) impacted by parental attitude (a coefficient of –0.300 with $t = -1.740$), while that for women is not ($t = 0.368$). As discussed above, adolescents hold opposite attitudes on this issue compared to their parents, primarily due to a greater consideration of their ability to reduce daily expenses, fuelwood collection labor, and housework. This is particularly true for men because they take on many of these responsibilities. Therefore, it is understandable that men are more in favor of living with parents (in opposition to their parents' opinions) than women are. When the data are pooled, this negative trend is no longer significant with a coefficient equaling –0.144 ($t = -0.915$).

Another significant difference from what we have found in the pooled data is the direction and magnitude of peer behavior on personal attitude towards leaving the parental home. The coefficient for men is 0.214 with $t = 2.566$, implying that men are strongly impacted by their peers, whereas women have a coefficient of –0.239 with $t = -2.851$, implying that they disagree with their peers' behavior on this issue. When the data are pooled, these opposite trends offset each other and show an insignificant relationship (a coefficient of 0.008 with $t = 0.1$, see Table 3). The frequency distribution of the indicator for peer behavior may account for this discrepancy, given that male and female personal attitudes are similar. As discussed in Table 1, peer behavior was defined to be the number of close or respected friends and relatives (of four identified by the respondent) who lived/had lived independently. The distribution of this variable for women is bell-shaped, with an average around 2.1, indicating that among the four people whose opinions females respected, 2.1 people lived independently, and 1.9 lived with parents. The distribution for men is slightly skewed, with an average around 3.1, indicating that among the four people whose opinions

males respected, 3.1 people lived independently, and only 0.9 lived with parents. This distinction may be due to the fact that men and women turn to different reference groups for the same concerns, i.e., women may tend to depend upon their elderly relatives of both genders (such as uncles and aunts; their aunts were less likely to live with parents) as their reference group, while men may tend to take their male friends and/or relatives of similar ages as their reference group, and most of these male friends/relatives live independently. Whatever lies behind this difference, our finding certainly warrants more research into the role of gender differentiation in home-leaving behavior.

SUMMARY AND SIGNIFICANCE

In summary, we found that (1) a person's tendency toward individualism is primarily impacted by his/her parents and perceived resource availability, with little impact from peers. This is somewhat inconsistent with findings in Western countries. (2) A person's attitudes towards leaving the parental home (an issue more specific than individualism) are primarily shaped by his/her tendency toward individualism, and perceived adverse effects. This conclusion is consistent with the findings of Gierveld et al. (1991). Parental attitude and behavior have insignificant impacts on adolescents' attitudes, while peers' behaviors have opposite influences on men and women. (3) A person's intention to leave the parental home and live independently is more complex, depending on both his/her preferences/attitudes and the perceived resource availability for so doing (especially for women), as suggested by Gierveld et al. (1991). Different ideas exist between parents and adolescents: Adolescents are more in favor of living with parents while parents are in less favor. (4) Non-transferable resources (material and non-material) tend to decrease a person's desire to leave the parental home, which is consistent with Gierveld et al.'s (1991) finding. Transferable resources have a more significant impact on women than on men. (5) Gender plays an important role in determining behavior patterns, as suggested in the literature (e.g., Hughes & Gove, 1981). Specifically, women in Wolong tend to rely more on parents and available resources when making decisions.

Clearly, the use of cross-sectional data limits our ability to determine exactly how these processes work and may mask the presence of reciprocal causation. For example, it is plausible that tendency toward individualism could be both a cause and an effect of leaving one's parental home. Hence, this research could be enhanced in the future by utilizing longitudinal mea-

surement of home leaving intentions and behavior. Despite this, we believe our research has provided a statistically sophisticated and well-reasoned approach to this phenomenon, especially considering the dearth of research in this area.

Our research is significant in three respects. First, from the perspectives of sociology and demography, our research is consistent with many findings from Western countries, indicating cross-cultural similarities. For instance, a person's attitude towards leaving the parental home is negatively impacted by the perceived adverse effects, which, in this study, represents "non-transferable" resources found to hamper the decision to leave the parental home (Gierveld et al., 1991). But in some ways our findings are inconsistent with prior research in Western countries. For instance, Gierveld et al. (1991) found that transferable material resources would speed up the decision to leave the parental home, while our findings showed that transferable material resources do not have significant impacts on either personal attitude toward leaving the parental home or the intention to do so. Besides the possible reasons we provided in the Discussion section, other factors (such as the roles played by different cultures, ethnic groups, and genders in influencing different behavior patterns) may account for these inconsistencies. This highlights the need for comparative studies between Eastern and Western societies in these aspects.

Second, from the perspective of research methods, our research represents an innovative effort to link the study of human population with that of wildlife conservation (or natural resource conservation, in a more extensive sense). As indicated by Liu (2001), separate studies in ecology, biology, and human population (demographics in particular), though important and necessary, are not sufficient in dealing with problems that are inherently intertwined across many disciplines. Using structural equation modeling based on social survey data appears effective in eliciting the factors and their quantitative interrelationships that are of sociological, demographic, and ecological concern.

Last, from the perspective of panda habitat conservation, our findings can assist reserve managers to better understand what and how demographic/psychosocial factors affect panda habitats. The bridge between this research and panda habitat is the escalating number of households relative to a more modest increase in human population size. On the one hand, our research identified what exogenous factors—in what directions (supporting or hampering), and to what extent—would determine a person's decision to leave the parental home. Over the entire landscape in Wolong, this implies that we could predict whether more (or fewer) new households would be initiated, given those exogenous factors. For instance, we ob-

served a significant positive impact from perceived resource availability upon the intention of leaving the parental home for women. Therefore, it would be effective for the Reserve managers to place some restrictions on obtaining land and wood in order to reduce perceived resource availability and thus discourage new household formation. On the other hand, as mentioned in the Introduction section, fuelwood collection is the critical factor that has degraded panda habitat. Given the number of households with the specific demographic and socioeconomic features predicted from this research, we could predict how much fuelwood would be needed based on our household-based fuelwood demand model (An et al., 2001) and electricity demand model (An et al., 2002). We could utilize this household-based research to study the spatio-temporal dynamics of the households over the entire landscape of Wolong if combined with geographic information systems (GIS) and demographic/ecological information in a spatially explicit context. This kind of spatially explicit dynamic model, capable of incorporating human population, ecology, and institutional factors, could be applied to study more complex issues, such as the overall interaction between a human population and its environment.

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REFERENCES

An, L., Liu, J., Ouyang Z, Linderman, M.A, Zhou, S., & Zhang, H. (2001). Simulating demographic and socioeconomic processes on household level and implications on giant panda habitat. *Ecological Modeling, 140,* 31–49.

An, L., Lupi, F., Liu, J., Linderman, M.A., & Huang, J. (2002). Modeling the choice to switch from fuelwood to electricity: implications for giant panda habitat conservation. *Ecological Economics, 42(3),* 445–457.

Baanders, A.N., Van Leeuwen, L.T., & Ploegmakers, M.J.H. (1989). Considerations in the decision to leave the parental home: anticipated consequences and normative expectations. *Family and Consumer Sciences Research Journal, 24(3),* 272–92.

Blank, S., & Torrechilla, R.S. (1998). Understanding the living arrangements of Latino immigrants: a life course approach. *International Migration Review, 32 (1),* 3–19.

Bollen, K.A. (1989). *Structural equations with latent variables*. New York: Wiley.

Britain, C.V. (1963). Adolescent choices and parent-peer cross-pressures. *American Sociological Review, 28,* 385–391.

Bronfenbrenner, U. (1981). Children and families-1984. *Society, 18 (January/February),* 38–41.

China Adolescence Development Foundation. (1992). *Research report on Chinese adolescents' development status (1992)*. Beijing: Social Science Literature Press.

China's Ministry of Forestry and World Wildlife Fund. (1989). *Conservation and management plan for giant pandas and their habitat*. Beijing.

Clemens, A.W., & Axelson, L.J. (1985). The not-so-empty-nest: the return of the fledgling adult. *Family Relations, 34,* 259–64.

Cooney, T.M., & Mortimer, J.T. (1999). Family structure differences in the timing of leaving home: exploring mediating factors. *Journal of Research on Adolescence, 9(4),* 367–393.

Dillman, D.A. (1978). *Mail and telephone surveys—the total design method*. New York: John Wiley & Sons.

Fan, C. C. (1999). Migration in a socialist transitional economy: heterogeneity, socioeconomic and spatial characteristics of migrants in China and Guangdong Province. *International Migration Review, 33 (4),* 954–987.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Reading: Addison-Wesley.

Gecas, V., & Seff, M.A. (1990). Families and adolescents: a review of the 1980s. *Journal of Marriage and the Family, 52 (November 1990),* 941–958.

Giant Panda Expedition, 1974. A survey of the giant panda (*Ailuropoda melanoleuca*) in the Wolong Natural Reserve, Pingwu, Northern Szechuan, *China. Acta Zoologica Sinica, 20,* 162–173.

Gierveld, J.D.J., Liefbroer, A.C., & Beekink, E. (1991). The effects of parental resources on patterns of leaving home among young adults in the Netherlands. *European Sociological Review, 7 (1),* 55–71.

Glick, P.C., & Lin, S. (1986). More young adults are living with their parents: who are they? *Journal of Marriage and the Family, 48 (February 1986),* 107–112.

Goldscheider, F.K., & DaVanzo, J. (1985). Living arrangements and the transition to adulthood. *Demography, 22,* 545–563.

Goldscheider, F.K., & Goldscheider, C. (1993). *Leaving home before marriage*. Madison: The University of Wisconsin Press.

Goldscheider, F.K., & Goldscheider, C. (1998). The effects of childhood family structure on leaving and returning home. *Journal of Marriage and Family, 60 (3),* 745–756.

Hughes, M., & Gove, W.G. (1981). Playing dumb. *Psychology Today, 15 (October),* 74.

Jones, G. (1995). *Leaving home*. Buckingham and Philadelphia: Open University Press.

Jöreskog, K.G., & Sörbom, D. (1996a). *PRELIS 2: User's reference guide*. Chicago: Scientific Software International.

Jöreskog, K.G., & Sörbom D. (1996b). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.

Jöreskog, K.G., & Sörbom D. (1996c). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Chicago: Scientific Software International.

Larson, L.E. (1972). The influence of parents and peers during adolescence: the situation hypothesis revisited. *Journal of Marriage and the Family, 34,* 67–74.

Liu, J. (2001). Integrating ecology with human demography, behavior, and socioeconomics: needs and approaches. *Ecological Modeling, 140,* 1–8.

Liu, J., Daily, G. C., Ehrlich, P. R., & Luck, G. W. (2003). The effect of household dynamics on resource consumption and biodiversity. *Nature, 421,* 530–533.

Liu, J., Linderman, M., Ouyang, Z., An, L., Yang, J., & Zhang, H. (2001). Ecological degradation in protected areas: the case of Wolong Nature Reserve for giant pandas. *Science, 292*, 98–101.

Liu, J., Ouyang, Z., Tan, Y., Yang, J., & Zhang, H. (1999b). Changes in human population structure: implications for biodiversity conservation. *Population and Environment, 21*, 45–58.

Liu, J., Ouyang, Z., Taylor, W.W., Groop, R., Tan, Y., & Zhang, H. (1999a). A framework for evaluating the effects of human factors on wildlife habitat: the case of giant pandas. *Conservation Biology, 13 (6),* 1360–70.

Mitchell, B.A., & Wister, A.V. (1989). The family environment and leaving the parental home. *Journal of Marriage and the Family, 51 (August 1986),* 605–613.

Montemayor, R. (1982). The relationship between parent-adolescent conflict and the amount of time adolescents spend alone and with parents and peers. *Child Development, 53*, 1512–1519.

Moore, D., & Hotch, D.F. (1983). The importance of different home-leaving strategies to late adolescents. *Adolescence, 18*, 413–416.

Putte, B.V.D., Saris, W.E., & Hoogstraten, J. (1997). Applying structural equation modeling in the context of the theory of reasoned action: some problems and solutions. *Structural Equation Modeling, 4 (4),* 320–37.

Raykov, T., & Widaman, K.F. (1995). Issues in applied structural equations modeling research. *Structural Equation Modeling, 2 (4),* 289–318.

Reid, D.G., & Jien, G. (1999). Giant panda conservation action plan. In C. Servheen, S. Herrero, & B. Peyton (Eds.), *Bear status survey and conservation action plan* (IUCN/SSC Bear and polar bear specialist groups), pp. 241–254. IUCN: Gland Switzerland and Cambridge, UK.

Schaller, G.B., Hu, J., Pan, W., & Zhu, J. (1985). *The giant pandas of Wolong*. Chicago: The University of Chicago Press.

Sebald, H. (1986). Adolescents' shifting orientation toward parents and peers: a curvilinear trend over recent decades. *Journal of Marriage and the Family, 48 (February 1986),* 5–13.

Stattin, H., & Magnusson, C. (1996). Leaving home at an early age among females. In J.A. Graber, & J. S. Dubas (Eds.), *Leaving Home: Understanding the Transition to Adulthood,* (pp. 53–69). San Francisco: Jossey-Bass Publishers.

Van de Kaa, D. (1987). Europe's second demographic transition. *Population Bulletin, 42* (whole issue).

Vos, S.D. (1989). Leaving the parental home: patterns in six Latin American countries. *Journal of Marriage and the Family, 48 (August 1989),* 615–626.

Westoff, C.F. (1983). Fertility decline in the West: causes and prospects. *Population and Development Review, 9*, 99–104.

Wong, L., & Huen, W. (1998) Reforming the household registration system: a preliminary glimpse of the blue chop household registration system in Shanghai and Shenzhen. *International Migration Review (Winter 1998), 32 (4),* 974–994.

World Wildlife Fund (2001). *Giant panda in the wild: 2001 WWF Species Status Report*. WWF International, Gland, Switzerland.

Wu, X. (1994). Rural to urban migration in the People's Republic of China. *The China Quarterly, 139*, 669–698.

Xu, W., & Tan, K.C. (2002). Impact of reform and economic restructuring on rural system in China: a case study of Yuhang, Zhejiang. *Journal of Rural Studies, 18 (1),* 65–81.