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## Waste Not, Want Not: An Ethnoarchaeological Study of Reuse in Tucson, Arizona

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and Michael McCarthy*

Americans are stereotyped as wasteful consumers. Two decades ago, Vance Packard (1959, 1960) argued that Americans discard a prodigious amount of usable material goods for the sake of having newer, less tarnished status symbols. As we now face energy shortages, inflation, and demands for recycling, "wastemaking" has become a respectable topic for scientific investigation and social action. Surprisingly, little is known about what happens to material goods after their original owners no longer find them useful. Jacoby, Berning, and Dietvorst (1977:22) remark that "virtually no conceptual or empirical work has been addressed to the general issue of disposition by consumers." In this chapter we attempt to formally organize the scientific study of one part of "disposition" processes, that having to do with the reuse of material goods. We contend that reuse substantially prolongs the life of material goods in the United States. Although Americans continually discard usable items, many goods are also circulated to other individuals and social units for further use. Using data collected by a pilot study of reuse patterns in Tucson, Arizona, we examine empirically the proposition that contemporary Americans conserve more material culture than the "wastemaker" image portrays. We document the prevalence of reuse processes and suggest some of the general factors that promote reuse in all societies.

## Preliminary Definitions

All societies practice to some degree conservation of material resources. By prolonging the life of material culture, reuse processes are among the simplest and most widespread conservation practices. Reuse processes occur when an object, after some period of use, undergoes a change in the user (a person or social unit) or the activity of use (Schiffer 1977:17). We will follow Schiffer's (1976a, 1977) provisional classification of reuse processes. *Recycling*, a familiar process in our society, occurs when a used item is remanufactured into a new item (adapted from Darnay and Franklin 1972:3). For example, after cutting and filing, a leaf from an automobile spring becomes a machete. *Secondary use* takes place when an unmodified item is employed in a different activity (Darnay and Franklin 1972:3). A common example is the use of a peanut butter jar for storing nuts and bolts. Recycling and secondary use may or may not involve a change in the user. *Lateral cycling* occurs when an object is transferred, without change in form or use, from one user to another (Schiffer 1972:159, 1977:32-33). For example, a sofa is sold to a new owner who uses it as a sofa. *Conservatory processes* or collecting behavior bring about a change in the use (but not form) of an object such that preservation is intended (Schiffer 1976a:39, 1977:33-34). (In effect, it is a specialized variety of secondary use.) American individuals as well as public and private institutions collect everything from Mickey Mouse memorabilia to light bulbs. Among conservatory processes we also include less goal-directed "accumulating" or "hoarding" behavior, the incongruous results of which can be found in attics, basements, garages, and closets.

A *reuse mechanism* is an activity that transfers objects from person to person, thus facilitating recycling, secondary use, lateral cycling and conservatory processes (Schiffer 1977:32). Societies have developed a bewildering array of reuse mechanisms, including inheritance, gifts, dowries, brideprice, pawn shops, markets, theft, black markets, swap meets, yard sales, auctions, junkyards, and thrift shops. Reuse mechanisms vary along a number of important dimensions. First of all, we note that the transfer need not involve the use of either money or a market system. Inheritance, gift, theft, dowries, and brideprice are cases in point. Secondly, reuse mechanisms vary greatly as to whether the social or economic aspect of reuse is dominant. Clearly, gift giving, swap meets, rummage sales, yard sales, and probably auctions have an impressive social component; on the other extreme are theft and many retail stores. Third, and especially in modern America, reuse mechanisms differ in the extent that transactions are recorded. Most retail stores and auctions document their transactions in detail for tax purposes. In many societies dowries, brideprice, and inheritance are a matter of public knowledge. On the other hand, gifts, yard sales, and swap meets entirely escape the record

keeping of our society, which is noted for its persistence in monitoring economic activities.

The data and analyses presented in the following show that, to a surprising degree, Americans employ reuse mechanisms having a large social component that involve neither record keeping nor money. Thus, techniques for determining the popularity of reuse based on established economic statistics will produce consistent underestimates. On the basis of these preliminary findings, we conclude that reuse in modern America is a widespread and important means of material conservation.

## Background to the Reuse Project

Since 1972 the senior author has intermittently studied reuse processes in Tucson, Arizona. Tucson is the largest city in Pima county, located in the Sonoran desert of southern Arizona. Its 350,000 people account for about two-thirds of this highly urbanized county's population. Tucson is an old but rapidly growing multiethnic city, having a mixed economic base consisting of mining, tourism, light industry, commerce, an Air Force base, and the University of Arizona.

Our investigations of reuse in Tucson have followed two complementary research strategies. First, we have studied a number of particular reuse mechanisms by drawing upon casual observations, questionnaires, and participant observation. The field studies, a few of which have been conducted in other cities, include thrift shops, antique stores (Claassen 1975), garage sales (Linton 1977), antique car clubs (Poor 1978), swap meets (Brown and Johnson 1973; Kassander 1973; Wood 1973), gifts (Young 1973), and second-hand stores (Brown and Johnson 1973; Kassander 1973). Schiffer (1976a,b) has partially summarized the results of these investigations. The second strategy, begun in 1976, focused on reuse patterns of households. It had become apparent by then that many of our hypotheses, involving relationships between socioeconomic variables and reuse patterns (Schiffer 1976a,b), could be most efficiently tested on a household level. To set the stage for presenting the results of the household interviews, we discuss briefly some findings from the background studies of reuse mechanisms.

Participant observation has been concentrated in recent years on two of the more colorful reuse mechanisms: yard sales and swap meets. In yard sales, one or more households offer for sale a motley assortment of "junk" and treasures, usually in a front yard, patio, or carport. These are generally weekend events, occurring mostly in middle class neighborhoods. Yard sales, which appear to have begun in Southern California in the early 1960s,

are now prevalent throughout the United States. Indeed, the classified section of newspapers often contains a "yard sale" entry. A handful of trade books have appeared advising potential buyers and sellers on appropriate strategies (Copeland 1977; Young and Young 1973). According to the participants, yard sales are held for a number of reasons, including securing extra cash and "getting rid of excess items," especially before a move (Linton 1977). During late spring and early summer—the heavy moving seasons—eager bargain hunters, and a handful of dealers, can be seen driving from sale to sale.

Quite clearly, yard sales are becoming an important means for American households to dispose of unwanted material goods, particularly at certain points in their history. We immediately grasped the possibility that other reuse mechanisms arose for similar reasons: to promote the transfer of used goods, when an individual or household undergoes a change in status, such as loss or gain of a member, rise or fall in income, or a move. We shall return in the following to these ideas.

Swap meets are periodic markets consisting of independent vendors. Like yard sales, the greatest amount of swap-meet activity occurs on weekends. In contrast to yard sales, which take place at private residences, swap-meet vendors congregate in a central location, usually in public facilities, such as parking lots and drive-in theaters, used primarily for other purposes. However, Tucson's most viable swap meets, Oracle Road and Tanque Verde, have their own exclusive facilities, including snack bars, rest-rooms, and entertainment for children.

There are three major kinds of swap-meet vendors. *One-timers* come occasionally, usually to dispose of a great variety of household items. In many ways, one-timers are similar to yard-salers in their reasons for engaging in reuse. *Part-timers* are likely to be hobbyists attempting to pick up extra dollars by specializing in a few types of items such as antique tools, coins, or clothing. Some part-timers, especially jewelers, have permanent shops in town but "moonlight" at swap meets. *Professionals* make most of their living at swap meets by selling a limited variety of new and used items. At the Oracle Road and Tanque Verde swap meets, a stable core of professionals can be found year round. During weekdays or at particular times of the year they attend auctions and engage in other reuse activities to secure their inventories. Professionals tend to make a relatively large investment in facilities, including elaborate display cases, awnings, lounge chairs, and other creature comforts.

Swap meets sometimes have an unsavory reputation, owing to the occasional discovery of stolen items and the attention drawn to these disclosures by more established merchants. Yet, with the many attractions swap meets offer, especially in times of economic difficulty, they are gaining ever-

greater numbers of participants. They are also becoming much more institutionalized and "accepted." In addition to the staple assortment of tires, guns, and tools offered by the professionals, one can also find displays by a real estate company and the National Guard. Tanque Verde swap meet even advertises on television with its own catchy jingle.

Our research into swap meets has suggested much about the nature of periodic markets (Schiffer and Schaefer n.d.), as well as informing us about certain characteristics of reuse processes. Specifically, we have formulated hypotheses about the socioeconomic correlates of reuse. For example, swap meets seem to involve the movement of items between members of the lower middle and upper lower classes (defined by income), as well as within these classes. Upper class individuals take part in swap meets as buyers, often searching for particular kinds of antiques or collectables. These tentative findings led us to hypothesize that many reuse mechanisms are class-specific, at least in terms of the kind and amount of participation.

## The Reuse Project

These first-hand glimpses into particular reuse mechanisms served to document some of the more public varieties of reuse in Tucson and furnished a series of testable hypotheses (Schiffer 1976b). However, it was apparent that to progress beyond vague impressions and gross concepts, we would have to examine reuse from the standpoint of households. If the hypotheses had any merits, household studies would disclose them.

With great trepidation and no funding, Schiffer and Downing launched a project in the spring of 1976 to investigate household reuse. With the assistance of a dozen, enthusiastic undergraduate students, we devised a questionnaire and pretested it in 20 households. The 17-page questionnaire was exploratory, with the directly administered questions reflecting the many hypotheses under consideration. Specifically, we obtained data on: (a) type and size of dwelling, (b) length of residence, (c) number of times the household moved in the previous 5 years, (d) household composition, including a kinship chart; and, for each individual, occupation, age, sex and level of education, (e) ethnicity and race for the household unit, (f) income, (g) rates of replacement and disposition of replaced items for a sample of furniture and appliances, (h) kinds of collections, (i) whether household members acquire or dispose of material culture by using various reuse mechanisms, (j) participation in swap meets and yard sales, and (k) an inventory of furniture and major appliances. For each inventoried item, we recorded its formal category (couch, TV), present use, how long it had been in the household's

possession, whether it was obtained new or used, whether it was considered to be an antique, and, if it was obtained used, the specific mechanism of acquisition.

The questionnaire was administered to 184 households during the spring semesters of 1976 and 1977. Interviewers were undergraduate student volunteers enrolled in several upper-division archaeology courses taught by the senior author and William L. Rathje at the University of Arizona.

Many factors influenced our sampling design; of these, statistical purity had the lowest weighting. First of all, because many of the interviewers lacked automobiles, the sample households had to be accessible by foot or bus. Second, because few of the students were bilingual, Mexican-American neighborhoods had to be excluded. Third, we wished to include an adequate representation of diverse socioeconomic classes, although not necessarily in proportion to their relative frequency in the population. Even with these constraints, a satisfactory sampling design was easily devised. Since U.S. census data indicated a general gradient of household income along the east-west midline of the city, it was possible to construct a simple east-west transect that cross-cut income groups and paralleled major bus lines, while avoiding predominantly Spanish-speaking neighborhoods. The transect, averaging 1 mile in width, consisted of 12 units—each approximating 1 square mile. Five additional square-mile units were purposely placed in other parts of the city to increase the number of low- and high-income households. Within each unit, 5 streets were randomly selected and letters of introduction that announced the possibility of an interview were distributed to a sample of the residences—houses as well as individual apartments and mobile homes. Skeptical or worried residents were encouraged to call the university to verify the legitimacy of the interviewer who might, we feared, be mistakenly accused of “casing” the premises. In the next step, the students attempted to conduct interviews in five households on each street. When no one was home or no adults were present, the interviewers either returned later or picked another residence. Quite frequently the interviewer was turned away. In that case as well additional households were selected. Overall, turndown rates were high, but varied in a predictable manner. They were lowest (ca. 20%) for teams of two, neatly dressed females. For a lone male, the rate went as high as 90%. As a result of various factors, including students who dropped the courses, incompatible teams, variable turndown rates, and the reluctance of students to venture into low-income neighborhoods, the actual number of interviews varied considerably among the sample units, ranging from 7 to 25.

Once permission was granted for the interview, few problems were encountered. Indeed, students complained that their greatest difficulty was in

concluding the interview. Most questions, even of a personal nature, were answered cheerfully. The exception was income. Twenty households, or 10.7% of the sample, refused to divulge their income or claimed ignorance. On the average, interviews lasted about 1.5 hours, with a range of 20 minutes to 2 hours. This length of time is correlated with the number of rooms occupied by the household, since the latter closely determines the number of items that must be inventoried.

In view of the many problems inherent in our procedures of household selection, we anticipated that the sample would be biased with respect to one or more important parameters. We have identified some of the biases by comparing selected variables with the results of a much larger interview survey ( $N = 1300$ ) done by the Valley National Bank and the *Tucson Daily Citizen* in 1976 (Table 5.1). In the Reuse Project sample, higher-income households are overrepresented relative to lower-income households. This

**Table 5.1**  
*Biases in the Reuse Project Household Sample<sup>a</sup>*

	a. Annual income (dollars)				
	0-9999	10,000-19,999	20,000+		
VNB/TDC	40%	39%	21%		
Reuse Project	32%	36%	32%		
	b. Time in present dwelling (as a percentage)				
	0-5 years	more than 5 years			
VNB/TDC	64	36			
Reuse Project	55	45			
	c. Ethnicity (as a percentage)				
	Anglo	Mexican-American	Black	Indian	Other
VNB/TDC	70	24	3	2	1
Reuse Project	94	6	0	1	0
	d. Home ownership (as a percentage)				
	Own	Rent			
VNB/TDC	71	29			
Reuse Project	69	31			

<sup>a</sup> Comparison of selected variables in the reuse sample with results of the Valley National Bank/Tucson Daily Citizen Survey (Tucson Newspapers 1976).

bias was predictable, given our deliberate effort to increase the absolute number of the rarer, high-income households. The sample is also biased against various ethnic groups, a serious limitation given the prevalence (24%) of Mexican-American households in Tucson. In addition, sample households tend to be more sedentary than those in the entire population. This bias is also to be expected because of the positive relationship of income to stability of residence (see following). Fortunately, the sample does accurately reflect the ratio of renters to owners of dwellings. It is evident that the high turndown rate may have introduced more subtle biases into the sample. Presently, however, we are unable to specify the characteristics of those households willing to cooperate versus those that would not.

Despite the biases in the Reuse Project sample and the relatively small number of interviews, we are confident that the data are adequate for a pilot study of major reuse patterns at the household level.

### Reuse Project Findings

Contrary to the "wastemaker" stereotype, the data indicate that reuse is widespread. All households admit to employing one or more reuse mechanisms for acquiring material culture. All households dispose of at least some unwanted material culture through reuse processes, as opposed to discard. In addition our results demonstrate a rather impressive involvement of social ties in reuse behavior. Let us examine these patterns more closely.

In order to evaluate directly the proposition that items replaced by a household are more likely to be reused than thrown away, the Reuse Project sought data on a sample of replaced items. Interviewers asked the following question:

One of the problems we all have is replacing furniture that is worn out, broken, or items that we are simply tired of. Now I will read you a short list of things, and I would like to know which ones, if any, you or any member of the household have replaced in the last 5 years (or the period since establishment of the household) and what you did with the old one?

The list contained 13 items: bed, couch, dining chair, easy chair, dresser, bookcase, stereo, TV, washer, dryer, dining table, range, and refrigerator. The results present a picture of consistent household reuse.

Respondents in our 184 households reported replacing 743 items, an average of 4 each. Of the total, 30.5% were retained by the household, the majority being recycled (12.8%), secondarily used (5.4%), or stored (6.0%); the remainder were abandoned (4.3%) or sold with the dwelling (2.0%). Another large segment of the replaced items (34.1%) was sold or

given to strangers or stores. The most popular of such disposal methods was gift to a thrift shop or charitable foundation (12.7%), sale to a stranger (5.0%) and sale to a new-used specialty store (3.6%). The latter includes trade-ins. Relatives (outside of the household) and friends were the recipients, by gift, sale, and loan of 29.9% of the replaced items. The most interesting finding of all is that only 46 items (6.2%) were thrown away.

Although the 6.2% figure should not be taken at face value, it does indicate overall that replaced items are seldom discarded. At least two factors influence the true discard rate. First of all, some of the items abandoned with a dwelling may be discarded eventually. However, even if all abandoned items are tossed out the total discard percentage would rise to just 10.5%. Second, objects that are thrown out may not reach archaeological context or stay there very long. Items of furniture and appliances are routinely scavenged from alleys in residential neighborhoods as well as vacant lots and the landfill (Schiffer 1976b). Indeed, large items are not collected by the city in their biweekly pickups. Thus, it appears that few pieces of furniture and appliances reach the Tucson archaeological record intact. Taking into account abandoned items and scavenging, we can conclude that the true percentage of items that enters archaeological context (and stays there) is probably below 10.5%. In any event, it appears that the vast majority of replaced items are indeed retained within the system and reused.

The Reuse Project also obtained some data on conservatory processes. Respondents were asked to identify the kinds of objects collected by members of the household, and to enumerate the acquisition mechanisms usually employed. Unfortunately, the respondent in most instances was not the principal collector. This problem raises considerable doubts about the reliability of the collection data, but we shall attempt to discern patterns in it nonetheless.

As might be expected, a majority of the households engage in conservatory processes: 62.5% collect one or more kind of item. This amounts to 296 collections, with a mean of 2.6 per collecting household. Although there were 61 different types of collection, 7 items account for 54% of the total. From most to least popular they are: books-magazines, records, plants, coins, stamps, rocks, and bottles. Curiously, 38 types of collection were unique. Among the unique items are music boxes, insulators, kitchen utensils, doilies, ashtrays, cigar boxes, cameras, and Hummel figurines. Collectors obtain objects from a bewildering variety of sources—virtually every conceivable mechanism is employed, although for any given collection only 1.3 reuse mechanisms are cited by the respondents. Because the respondents are not likely to know the entire range of mechanisms resorted to by all collectors in the household, we can surmise that the latter figure is probably a sizable underestimate.

Consistent with our earlier findings, we discovered that conservatory processes depend heavily upon transfer of objects, both new and used, among friends and relatives. Of the 392 acquisition mechanisms listed 101 or 25.5% are *gifts*, mostly from friends and family. Purchase from a friend or relative accounts for another 7.9%, bringing to one-third the fraction of acquisition mechanisms dependent upon close social ties. The actual percentage of collected *items* may even be higher than the one-third figure. Perhaps it would be useful to view collections, particularly those of a hobby as opposed to an investment nature, as primarily a by-product of gift giving in a social context. Exploration of this idea can make use of information on the age and sex of collectors of varying items. We would expect type of collection to be dependent upon the sorts of relationships established between the collector and his or her social field and these are likely to be influenced strongly by age and sex. Harrington (1976), using only the 1976 Reuse Project questionnaires ( $N = 57$ ), discerned some patterning of collections by age and sex. She found, for example, that record collectors tend to be males, aged 26 to 35. We have not further analyzed the data with this question in mind, but we suspect that such patterns will be found in the larger sample. Based on the present slim evidence, it would appear that gift giving to supply collectors is an important process for cementing social ties, kin and nonkin, in our society.

Data from the furniture-appliance inventory also hold some gratifying surprises about the prevalence of reuse in Tucson. In over one-third of the households (37%), more than half of the furniture and major appliances were received in used condition (Figure 5.1). Only 8% claim to own no used items. In addition, 32.2% of the entire furniture-appliance inventory of 7499 items was obtained used. This high estimate of reuse nevertheless is

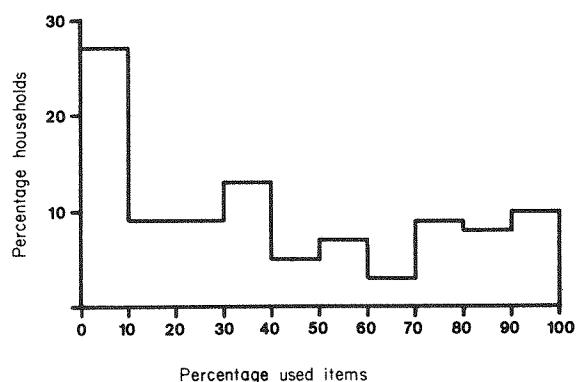


Figure 5.1. The occurrence of used items in a sample of 184 Tucson households.

probably an *underestimate*, because the sample bias favors high-income households which, as we shall see below, engage less frequently in reuse.

Interesting results emerge when we examine which reuse mechanisms supplied the 2412 used items in the furniture-appliance inventories. The eight most popular mechanisms are displayed in Table 5.2. These can be grouped into three general categories that account for 86.5% of the acquisition events:

1. Obtained from a relative or friend (41.2%).
2. Acquired with the dwelling (28.4%).
3. Purchased in a store (16.9%).

Quite clearly, there is a remarkably high reliance on unrecorded, nonmarket transactions. Apparently, kinship and social networks provide households with access to material goods. Purchase from a store is a last resort that contributes only a small fraction of the reused items. In fact, all retail sales combined (new-used specialty stores, auctions, junk shops, and thrift stores), supplied only 16.9% of the used items. Apparently, a monumental amount of economic activity (i.e., transactions in material goods) escapes formal record keeping entirely. A large number of households have obtained some of their furniture and appliances without participating in the marketing system! It would seem that our industrial society has some characteristics usually considered to typify "primitive" economies. Although market mechanisms are employed, a substantial amount of household reuse is facilitated entirely by social ties—not unlike other societies.

Before reuse processes are considered further, it is useful to explore basic patterns of material goods in Tucson households. In this way, reuse processes can be viewed against a backdrop of more general household pro-

Table 5.2

The Eight Most Popular Mechanisms for Acquisition Based on 2412 Used Items

Mechanism	Percentage of items
Gift from a relative	19.9
Rented with a dwelling	19.5
Purchased at a new-used specialty store	11.9
Inheritance	9.5
Gift from a friend	5.8
Purchased with dwelling	5.6
Found with dwelling	3.3
Purchased from a friend	3.3
All others	18.0



cesses. These analyses are based on the Spearman rank correlation coefficient, a nonparametric test that is well suited to the abnormalities of behavioral data (Nie, Hull, Jenkins, Steinbrenner, and Bent 1975).

The first hypothesis treats the relationship between residential stability and the size of a household's inventory of material goods. Some economists, social anthropologists, and archaeologists believe that as social units become more sedentary, the number of their possessions increases. At the most general level, this hypothesis is already well supported (Spier 1973). Highly mobile hunter-gatherers accumulate few material items compared to more sedentary village agriculturalists. The material culture of the latter is dwarfed by totally sedentary industrial cities. We seek to examine this relationship on an intrasocietal level. In the Tucson study, residential stability is indicated by the number of household moves in the previous 5 years. The fewer the moves, the more stable the household. The total number of items in the furniture-appliance inventory is taken as an index of the household's material culture burden. The variables are somewhat related, with a coefficient of .37. Although our test furnishes slight support for the hypothesis, other variables are also involved, as we shall see. Interestingly, the data suggest a not very surprising *at rest effect*: The longer a household remains at a residence (measured as "time since last move") the more items it accumulates.

Another common assumption is that the number of people in a household is closely reflected in the number of household items and the size of the dwelling. Our analyses partially support this assumption. Household size and the total inventory of items are weakly correlated ( $\rho = .34$ ); household size is a bit more strongly related to dwelling size ( $\rho = .48$ ). Dwelling size, however, was measured by the number of rooms rather than total floor area—though both must be highly covariant. Interestingly, the number of rooms and inventory size are related more closely to household income than to household size. Clearly, household income is a strong determinant of material goods and dwelling size.

This series of bivariate relationships is summarized in Figure 5.2. The graphic model portrayed should not be confused with a path analysis; it is merely our impressionistic causal model based solely on theory and supported by the Spearman's rank correlation coefficients. Had a path analysis been undertaken, the model probably could have been streamlined somewhat. Nevertheless, we believe it is a good starting point for discussing the most general relationships between household dynamics and material culture.

Given this model as background, we can now probe reuse processes in more detail. Four composite variables were used in the analysis:

1. The number of used items in the furniture-appliance inventory.
2. The percentage of used items in the furniture-appliance inventory.

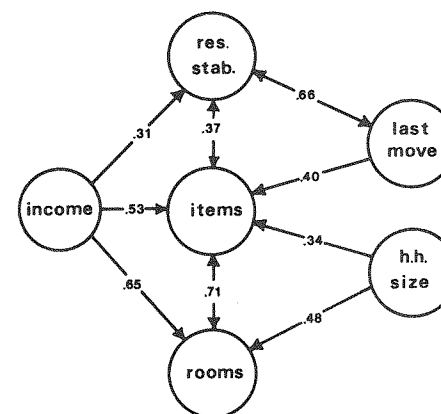


Figure 5.2. A model of basic material-culture dynamics at the household level. Numbers refer to values of Spearman's rank correlation coefficient.

3. The number of different mechanisms employed by the household for acquiring used items.
4. The number of different mechanisms employed by the household for disposing of items.

With respect to these reuse variables, several patterns are found. We must point out, however, that most of the rank correlation coefficients are rather low, between .2 and .6, indicating minor trends rather than dominant regularities. It should also be noted that the highest correlation, .72, was obtained between the variety of reuse processes employed for both disposal and acquisition. The results are as follows:

1. More mobile households tend to have a greater number and larger percentage of used items and to employ more varied reuse mechanisms for disposal and acquisition.
2. Lower-income households, and those with smaller dwellings, tend to have a larger number and percentage of used items and to utilize a greater variety of reuse mechanisms for disposal and acquisition.
3. As the "time since last move" increases, households tend to have fewer used objects and to utilize a more limited range of reuse mechanisms for disposal and acquisition.
4. Higher-income households tend slightly to replace basic furniture-appliance items (couch, washer, etc.) at a higher rate than lower-income households, thus creating considerable opportunities for reuse.

The most interesting finding of all, however, is that neither income nor residential stability are related as strongly with the number of used items as

either the age of the household's principal adult male or female. As the people grow older, the number of used items they own declines. This finding raises questions about the completeness of the preceding analyses; for it indicates that an additional causal process underlies the bivariate relationships. The major independent, underlying variable that seems to be at work is the stage of household development. In all areas of material culture and reuse processes, immature, early-stage households should contrast sharply with more developed ones. We hypothesize that as household development proceeds, residential stability, income, household and dwelling size and the inventory of material items should all increase. At the same time, the number of used items should decline, as will participation in reuse processes for acquisition. As the most advanced stages are reached, these trends may reverse, as household income drops and they become more mobile. In order to evaluate these hypotheses and to learn if the household developmental cycle is an important variable underlying the patterns, we turned to other analytical tools.

It was first necessary to scale households according to developmental stage. A classification devised by an urban geographer served our purposes (McCarthy 1976), although its cross-cultural applicability is certainly limited (Table 5.3). This scheme contains eight stages, beginning with a young, single head of household and progressing through a predictable sequence of aging and children. The system breaks down slightly in the last three stages, for they do not necessarily fall along the same household trajectory. In addition, many anomalous households were forced into the latter three categories—households which probably follow analogous but very different developmental cycles. Given these problems, the first five stages should be the most reliable for testing the hypotheses. The results are displayed in Figure 5.3, while the basic data are contained in Table 5.4.

**Table 5.3**  
*The Stages of the Developmental Cycle of the Household. Adapted from McCarthy (1976:58).*

Stage	Composition
1	Young, single head; no children
2	Young couple; no children
3	Young couple; young children
4	Young couple; adolescent children
5	Older couple; older children
6	Older couple; no children
7	Older single head, no children
8	Single head; with children

**Table 5.4**  
*Reuse Project Data Showing the Relationship between Developmental Stage of the Household and Selected Material-Culture, Socioeconomic, and Reuse Variables<sup>a</sup>*

Household stage	Sample size	Income <sup>b</sup>	Household size	Dwelling size <sup>c</sup>	Years in dwelling	Percentage of home ownership	Total items	Percentage of rented items	Age of oldest item	Percentage of used items
1	35	9.1	1.77 (.84)	2.9	1.77 (1.47)	17.1	25.48 (11.83)	23.7	5.88 (5.82)	74.9
2	19	27.8	2.36 (.68)	5.3	2.21 (2.41)	21.1	30.52 (11.63)	24.1	9.11 (13.87)	55.0
3	22	60.0	4.09 (1.01)	40.0	3.22 (2.04)	72.7	38.09 (16.10)	2.0	12.48 (6.36)	39.8
4	15	80.0	4.60 (.82)	50.0	4.93 (3.41)	86.7	49.00 (10.30)	1.9	18.80 (11.75)	26.0
5	16	57.1	4.43 (1.31)	9.4	12.81 (7.4)	100.0	67.00 (17.86)	.5	30.41 (17.10)	16.6
6	42	75.7	2.44 (.73)	25.1	13.95 (10.79)	95.2	51.65 (31.80)	.9	30.90 (14.29)	22.5
7	21	33.4	1.13 (.35)	12.9	17.00 (13.00)	95.2	65.72 (122.21)	.8	38.40 (20.17)	26.9
8	8	42.9	2.37 (.51)	— <sup>d</sup>	9.74 (2.58)	75.0	33.12 (8.00)	.5	23.13 (23.81)	30.9

<sup>a</sup> Note that most variables are recorded as mean values for each stage. These data are the basis for Figure 5.3. Where appropriate standard deviations are provided in parentheses.

<sup>b</sup> Recorded as the percentage of households having an annual income greater than \$14,999.

<sup>c</sup> Recorded as the percentage of households having greater than five rooms in their dwelling.

<sup>d</sup> Lost data.



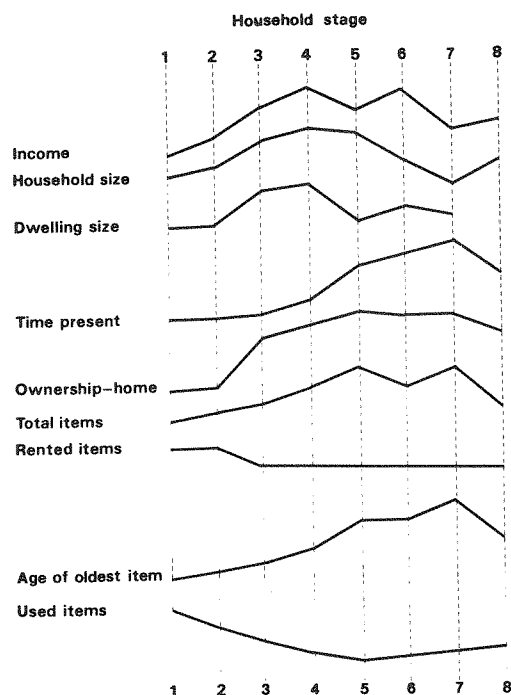


Figure 5.3. The relationship between developmental stage and selected variables of households in the Reuse Project sample.

As we would expect, income and household size go up regularly until Stage 5 is reached, when both decline. Consistent with our earlier findings, dwelling size behaves in a fashion quite similar to income; it, too, experiences the most precipitous drop as the founding couple and their children grow older (Stage 5). The remaining general patterns also conform closely to the predictions. The number of years present at the dwelling gradually increases through the developmental cycle (until Stage 8); this is paralleled by a rise in the number of homeowners.

Material goods and reuse practices keep pace with household development. The total number of items grows regularly as the household matures; after Stage 5, it fluctuates. The percentage of rented items, which never exceeds one quarter of the household inventory, plummets quickly to near zero when couples begin having children (Stage 2). As we expect, the age of the oldest item in the household rises, all the way to the household's greatest maturity. And, finally, the percentage of used items falls briskly at a fairly constant rate, until it begins a slow rise at Stage 6. These graphs, it should be

emphasized, are based on *mean* values for each stage, and, in many cases, the standard deviations are high. Despite our small and biased sample, the vagaries of Tucson households, and the use of means, the regularities in material-culture dynamics of households seem clearcut and consistent.

Given the limitations of our data and consequent lack of more fine-grained causal analyses, we cannot state that the developmental stage of the household, *per se*, is the most influential variable in determining material-culture and reuse patterns. We have clearly demonstrated that it is important. We are inclined to believe that income, residential stability, and time since last move may go a long way toward explaining much of the residual variability.

Examination of a subset of our sample illustrates how the variables working together influence material culture and reuse behavior. Forty-two households were composed of an older couple without children (Stage 6). In this stage are retired people as well as those who still work, and both groups contain high- and low-income households. Some have not moved for a long time (in one case more than 50 years) and retain a fairly large house with many furnishings. Those which have recently moved, however, usually have many fewer items. If they migrated to Tucson from a distant state, most of their furniture and appliances were purchased on their arrival, and are likely to have been bought new. Presumably, they disposed of their previous furniture and appliances just before moving. Clearly, these statements cannot be statistically validated because of small sample size, yet we believe the patterns are fairly robust.

### Cross-Cultural Implications

Studies of specific reuse mechanisms and the results of the household interviews enable us now to frame a number of specific, potentially cross-cultural hypotheses regarding household material culture and reuse.

In any society, the kinds and quantities of household material items, including dwellings, should be related to four principal factors:

1. Stage in the developmental cycle of the household (i.e., size and composition).
2. Residential stability.
3. Time since last move.
4. Wealth or income.

These, we believe, are fairly strong determinants and should account for much of the gross variability in household material culture within a society.

Insofar as reuse is concerned, it is suggested that the major factors promoting household *acquisition* through reuse processes are:

1. Early stages of the developmental cycle.
2. Low status or income.
3. High residential mobility.

Ethnicity may also influence the relative importance of certain reuse processes, but the Reuse Project's sampling bias has prevented systematic exploration of this variable.

We also can begin to specify the kinds of recurrent, general situations where in all societies opportunities are created for the disposal of material culture. As in Tucson, these situations may produce items that are reused rather than discarded.

Whenever there is a change in the social status of an individual various items of a household's inventory will no longer be appropriate and may be reused by others. Status changes are categorized as follows:

1. *Age-dependent*. Clothing is outgrown; items of enculturation and recreation change; and, of course, cosmetics and medicines vary.
2. *Rites of passage*. Socially recognized stages often require the addition or deletion of material items, either as symbols or for performance of new roles. Rites of passage can create substantial reuse opportunities. Death obviously is the most far-reaching of these events, and may lead to much reuse through the mechanism of inheritance.
3. *Achieved status positions*. When individuals attain new positions in the social order, primarily during adulthood, they acquire new material symbols and may dispose of old ones. Some of the latter may be reused.

Just as changes in an individual's status have consequences for material culture and reuse, so also do changes in the developmental cycle of social units. As social units vary in size or composition, alter their activities or move from one dwelling to another, reuse opportunities arise. For example, when households enter an expansion phase they may occupy more or larger dwellings. A smaller one left behind may be reused. Households in a contraction phase, particularly when they move, may dispose of a considerable amount of material culture. Similarly, as communities age, more material simply becomes available for reuse processes.

The extraordinarily high rates of household formation and dissolution that currently characterize the United States are contributing to the growth in importance of reuse mechanisms such as yard sales and swap meets. Avoidance of sales taxes and the reduction in disposable income may also help to account for the increased popularity of these reuse mechanisms.

Another factor at work is the high rate of residential mobility. Fewer children are living in the same town as their parents or other family members, thus creating a situation that has greatly reduced the opportunity to pass along items to relatives. As a result, items which would once have been stored for future use by family members are increasingly being sold to friends or strangers. These factors together, in the context of general economic uncertainty, are making reuse processes an increasingly visible economic activity.

Together, the preceding statements form a network of hypotheses that can orient cross-cultural investigations of reuse. Our studies have isolated certain factors that seem relevant to explaining variability in reuse. In addition, a series of recurrent situations has been identified that provide a potential for the occurrence of reuse processes. As these are examined in a variety of sociocultural settings, more refined hypotheses will certainly replace our provisional formulations.

## Conclusions

On the basis of Reuse Project findings, tentative though they may be, we anticipate that reuse processes are widespread and constitute an important set of strategies for households to obtain and dispose of material goods. These results clearly call into question the view that Americans irrationally waste resources by throwing away perfectly usable items. On the contrary, it appears that the high rates of acquisition and disposal of goods in more mature, affluent households—admittedly generated by status needs—make available a flow of serviceable items to early stage and poorer households. Our data suggest that relatively few intact items of furniture and appliances ever enter the sanitary landfills of a modern city. One or more reuse mechanisms would have intervened to make this an unlikely occurrence.

At the present time, planners and policy makers at various levels of government are trying to come to grips with the world of scarce energy and resources that mankind faces in the last 2 decades of the twentieth century. Before any of the measures for energy and material conservation are adopted, we should be able to predict how they will affect on-going reuse processes. After all, reuse processes are a means of material conservation already employed by a majority of households. Unfortunately, the prevailing opinion that reuse processes are insignificant has hindered investigations of the topic. In the long run, Americans may pay dearly for this ignorance, particularly if government-imposed programs inadvertently disturb current reuse practices, causing less, not more, conservation of our resources. In order to prevent this, we need to obtain additional ethnoarchaeological information on present-day reuse behavior so that disruptions can be minimized by care-

ful planning. It would appear that ethnoarchaeology's unique perspective, a concern with the behavioral context of material culture, is indispensable for properly managing complex societies.

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## Graffiti and Racial Insults: The Archaeology of Ethnic Relations in Hawaii

*C. Fred Blake*

When asked for his impressions of America after an absence of some 35 years, Professor Fei Xiaotong, a leading anthropologist in the People's Republic of China, replied: "Jogging and writing on subway walls—what do you call it?" Graffiti," I responded. Dr. Fei qualified his remarks by stating that his impressions of America may be superficial since he only had 1 month, and that, he said with a note of frustration, was spent mostly in the company of other professors!

Professor Fei's remarks struck a familiar chord. Only several months before, I had occasion to speak on my impressions of China—I had traveled there for 2 weeks during the summer of 1978. As with professor Fei, I caught only fleeting glimpses of the common people's daily lives. My tour included many public parks and ancient temples. Here I encountered an unexpected phenomenon, one which had a lasting impression on me. It was the *cu ke* (or "graffiti"), especially the poetry scrawled all over the Liu Ho Pagoda in storied Hangchow.

This uncanny coincidence of impressions (I with Chinese *cu ke* and Fei with American graffiti) is possibly explained by the frustration we each felt at not having anthropological access to the common people during our respective tours. To encounter the thoughts of common people on walls was bound to leave vivid and lasting impressions on the minds of two frustrated anthropologists. In fact as I toured China I sometimes felt like an archaeologist barred from the voices of the living and having to rely on such residues of by-gone behaviors as graffiti.