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Fairness of Adjudicated Allocations

by

Miho Hotta, B.A., M.A.

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirement for the degree of**

Doctor of Philosophy

Department of Psychology

Carleton University

Ottawa, Ontario

April, 1992

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Miho Hotta, B.A., M.A.

in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

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Abstract

Two studies were conducted to investigate how adjudicators make a decision in allocating a limited resource and how adjudicators and observers judge the fairness of the allocation decision. In Study 1, 72 subjects were asked to serve on a hypothetical student loan selection committee. Each subject was given access to a set of completed loan application forms which were stored in a computer data base, and asked to examine application information as much or little as he or she wished until reaching a final decision. After completing the decision task, the subject was asked to evaluate fairness of his or her own decision making. In Study 2, each subject observed the allocation decision made by another person in Study 1, and was asked to judge its fairness. The results of the two studies indicate: 1) different psychological influences of two determinants of seriousness of allocation situations (i.e., resource scarcity and applicant population) on adjudicators' decision making processes; 2) several decision making factors which may vitiate the fairness of adjudicated allocations; 3) independence of allocation principles, procedures and outcomes; 4) adjudicator-observer differences in fairness judgments; and 5) gender differences in fairness judgments. Implications of the present studies to human decision making research and psychological studies of social justice were discussed.

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Chapter 1: Allocation of Resources

Justice has been one of the greatest concerns in our society since humans began to create social orders for allocating material properties (e.g., food, land and facilities) and nonmaterial properties (e.g., money, power, status, rights, responsibility and affection). Parties at various levels in society - individuals, families, communities, and nations - frequently argue about what is fair and what is not. The history of humans is a history of efforts to establish and maintain certain styles of social order by allocating power, rights, responsibility, and material properties. Much of our history "consists of power struggles over access to scarce resources" (Lerner, 1981, p. 488).

Philosophers have been interested in social justice or fairness for more than 2,000 years. The interest can be found in Aristotle's concept of merit (i.e., a person should receive what he or she deserves). The contractarianism of Hobbes and Locke, the utilitarianism of Hume and Mill, and the socialism of Marx, all are concerned with how a fair allocation can or should be maintained in a society (see Cohen & Greenberg, 1982, for a brief review of philosophical arguments). The issue of justice has gathered attention not only from philosophy but also from disciplines in social sciences such as politics, economics, law, and management. Social psychology is one of these (e.g., Adams, 1965; Deutsch, 1975; Homans, 1961; Lerner, 1977; Lind & Tyler, 1988; 1977; Thibaut & Walker, 1975). Most social psychological research tries to describe how and why individuals or groups perceive fairness or unfairness, how they make fair allocations, and what their reactions to unfairness are, rather than to prescribe how allocations should be made (which philosophers, economists, and political scientists have done).

Humans have invented several ways to allocate limited resources. One extreme, for

example, is aggression and violence; fights are fought and the winner obtains the spoils. Powerful leaders may decide who will receive a limited resource, and enforce their decision through threats or intimidation. A market economy may allocate limited resources according to wealth or the ability to pay. Allocations of a limited resource may be made by bargaining or negotiation among those requesting it. The interested parties may together select a mediator who will help the negotiations. Interested parties may also resort to an arbitrator or a judge who will resolve their allocation conflicts by evaluating the merits of their arguments for the resource. Legal systems are designed to serve this arbitration function. So too are the thousands of committees, boards and similar agents empowered to decide who receives what, when and how. Included here are admissions and hiring committees, immigration and licensing boards. The situations in which these judges or mediators make their allocation decisions are collectively known as adjudicated allocations.

Adjudicated allocations are frequently employed for important decisions in many facets of our society. Especially in industrialized society, the practice of sharing resources has become less common and people often wish to determine to whom a resource fairly belongs. When a resource is to be allocated among parties who wish to gain it as their own, conflicts among them may increase; an adjudicated allocation then becomes a popular means for resolving conflicts. The popularity seems to be largely the result of the perceived fairness of an adjudicated allocation. Allocation decisions are expected to be made by neutral parties in a fair way.

Triage is one example of an adjudicated allocation in our society. The term triage originally referred to the assignment of priorities of medical treatment on the battlefield based on urgency or chance of survival. Triage is now an everyday decision in medicine (Teres, 1989): Whose prognosis is maximally improved by the medical care available? Does critical care have first priority to receive the limited funds? Which patients can receive

an artificial kidney? Should newcomer's claims be ignored to complete early arrivers' claims when beds in a hospital are filled? In our age, there have been impressive developments in medical care systems and technology, especially in critical care such as artificial organs, transplantation of organs and the Intensive Care Unit system . However, not everyone can have access to these life-saving inventions; they are costly or rare. The triage decision may affect the survival of patients, especially in allocations of the critical care. Many people have sought the best criteria and proceçures for allocating medical resources (e.g., Childress, 1973; Kanus, 1989). Which criteria should be used? Only medical criteria, such as probabilities for survival (Knaus, 1989)? Or, should social value of the patients be considered? (Alexander, 1977)? If social criteria, what would they be: occupation, personality, or age? Who is to make the decision? Physicians as experts? Policies or laws as legal guideline? A committee of laypersons as representatives of public opinion (Alexander, 1977)? Or by lottery or some form of randomness (Childress, 1973; Ramsay, 1977)? Despite their different points of view, most agree that the decision makers should not be patients themselves but rather someone else, and adjudicated allocations are employed.

The judgment of applications for immigration is an adjudicated allocation of legal status. Immigrants to countries such as Canada have made immense contributions by providing labor force, by increasing the domestic market, and by creating its unique multiculture (Manpower & Immigration, 1974). However, negative consequences of accepting immigrants have been recognized: housing shortages, increasing demand for transit facilities and community services, the burden of financing the social security system, and conflicts among different ethnic groups. Because of these negative aspects, not all the applicants can be accepted for immigration, and a selection process is inevitable. The selection process is required to be fair especially because the immigration is closely related

to the human rights of applicants. Hence, an adjudicated allocation is employed for immigrant selection.

In academic disciplines, there are several examples of adjudicated allocation. The resources to be allocated among scholars can be research funding, academic positions, journal publications, and research staff (e.g., research assistants, secretaries). Resources such as journals have increased enormously over about 60 years (e.g., De Meuse, 1987; Thomas, 1982; Thorngate & Plouffe, 1987). However, applicants who require such resources have increased more rapidly than the resources, and their acquisition has become more competitive. For example, the APA report shows that 45% of 1072 articles submitted to APA journals in 1960 were rejected, whereas 72% of the 5182 submitted in 1990 were rejected (APA, 1961, 1991). Justice or fairness in distributing limited research resources has become more important than before (e.g., Prager, 1984; Thomas, 1982; Wyngaarden, 1984). Heated discussion concerning allocation in research resources has focused on a popular "peer review system" in which researchers in a given field make judgments of their peers' applications for publication or for research funding (e.g., Ceci & Peters, 1984; Furedy, 1987; Surwillo, 1986). Debates on fairness of the review system continue regarding subjectivity of judgments, possible biases against unknown applicants (Ceci & Peters, 1984; Crane, 1967; Furedy, 1987; Rowney & Zenisek, 1980), and responsibility of anonymous review (e.g., Surwillo, 1986).

Although we can observe many adjudicated allocations employed for important decisions in society, almost no psychological research has examined them. In the next chapter, I attempt to describe some psychological research questions concerning adjudicated allocations.

Among many interesting research questions about adjudicated allocations, I would like to focus on two: How do adjudicators make allocation decisions? How do adjudicators and

observers perceive the fairness of allocation decisions? In order to examine these two issues, I consider three components certainly involved in allocation decision making and likely involved in the perception of fairness: (1) allocation principles; (2) allocation procedures; and (3) allocation outcomes.

Chapter 2 : Adjudicated Allocations

2.1 Elements of adjudicated allocations

Before I proceed to examine issues about adjudicated allocations, I would like to clarify some key terms used in this thesis. The adjudicated allocation is one of the various forms of allocation situation. In its simplest form, an allocation situation consists of three elements: resources, applicants, and allocators. In an allocation situation, a resource is divided into varying portions and given to applicants by allocators on the basis the allocators' judgment of deservingness.

A resource is either a material or nonmaterial property which is to be distributed. For example, a certain amount of money may be distributed as a reward among co-workers. A parking lot on campus may be selectively assigned to students and staff coming to school by car. Mother's attention may be shared among her children. Positions as managers in a company may be assigned to some of the employees. Grades may be distributed among students in a class by a teacher. Portions of the resource can be either continuous or discontinuous. A reward of \$1,000 can be portioned into \$ 500 and \$500, \$999 and \$1 or even \$1,000 and zero, whereas a position as manager cannot be shared.

An applicant is someone who requests part or all of a resource. An applicant may or may not receive a portion of the resource. This is why I call those who are considered for a portion of a resource "applicants" rather than "recipients" (cf. Eckhoff, 1974). There may be only one applicant or more than one, and they may be individuals or groups.

An allocator makes the allocation(s) of a limited resource among applicants. An allocator can be either an individual, such as a teacher who distributes grades among his or her students, or a group of individuals, known as committees or boards. Allocators are,

directly or indirectly, consciously or unconsciously, affected by their act of allocating the resource. For example, if a manager distributes a reward between him/herself and his or her co-workers, the outcomes of his or her allocation decisions directly influence his or her income. If the manager distributes the reward among his or her subordinates, the outcomes of his or her allocation do not directly influence him/herself. However, the manager may be evaluated later based on how he or she distributes the reward (indirect influence), and he or she may or may not be conscious of this future influence of his or her allocation decisions on him/herself.

As noted earlier, the term, adjudicated allocation, refers to a situation in which an allocator makes decisions about distributing a resource to one or more applicants. The adjudicated allocation can be differentiated from an allocation situation in which an allocator distributes a resource between him/herself and the other(s). I call the latter situation the self-involving allocation in contrast with the adjudicated allocation. In adjudicated allocations, the allocator is not requesting the resource, but rather acts like a judge or a manager who allocates the reward among his or her subordinates.

An adjudicated allocation can be either a test or contest. Adjudicated tests have no upper limit on the resource to be allocated; everyone who deserves a part of the resource gets it. In contrast, adjudicated contests do have an upper limit; it is thus possible that some who deserve a resource do not get it because others deserve it more. Suppose that a teacher is marking the exam of his or her 100 students. If the teacher decides to give an "A" to any students whose marks are higher than 80%, as many students may get an "A" as satisfy this criterion. On the other hand, if the teacher decides to give an "A" to students who are in the top 10% of the class, only 10 "As" are available to 100 students. The former is a test situation, whereas the latter is a contest situation.

An individual involved in an adjudicated allocation can take one of the three different

roles: adjudicator, applicant, or observer. Adjudicators are the allocators; they make resource allocation decisions but do not receive any of the resource themselves. Applicants are those who are requesting a resource. Observers are those who evaluate the allocation decisions made by adjudicators. Although applicants can also evaluate the decisions, however, observers in my terminology are differentiated from applicants; observers are not requesting the resource, whereas applicants are.

Adjudicators must consider three different components of decision making. The first component includes allocation decision principles, which are the judgment criteria adjudicators use to guide the allocation decisions. Allocation decision principles include (1) distributive philosophies (e.g., allocating a resource according to an applicants' needs, according to applicants' efforts, or equally among all applicants) and (2) application items of information used to establish applicant preference (e.g., income, GPA, age). Such items are considered as concrete principles in making decisions, being expected to reflect adjudicators' abstract criteria such as distributive philosophies. The second component includes the procedures for making allocation decisions. Procedures in this thesis refer to the decision process by which resources are allocated, such as how to examine applicant information, how to judge each applicant and how to integrate the judgements into final decisions. The third component includes the outcomes of allocation decisions. Outcomes refer to the results of decisions: who is given how much of the resource. Justice based on the principles or the outcomes of allocation decisions is called distributive justice, whereas justice based on the procedures of allocation decision is called procedural justice.

2.2 Roles in adjudicated allocations

A set of acts becomes a social role, and members in society expect an individual in a certain position to play the social role. It seems reasonable to expect that the role an individual occupies may change his or her concern with fairness of allocation. Persons

such as adjudicators whose role involves enforcing a set of fair rules or proposing a solution to conflicts may display more concern with fairness than those occupying other positions (Leventhal, 1980). Persons occupying different roles may be concerned with different aspects of allocation in judging its fairness. For example, applicants may be more concerned with the outcomes of allocation decisions than adjudicators, and adjudicators may be concerned more with their procedures. We often hear about discrepancies in perceiving the fairness of allocation between adjudicators and applicants. For example, while a teacher claims that grading was based on fair procedures, a student may complain about his or her grading because of its outcomes: "I studied very hard but did not receive what I think I deserve." Observers may also perceive fairness differently from adjudicators or applicants. Students in another class may think that the teacher's grading was unfair compared with their own experience: "His teacher is not fair. My friend did not work as hard as I did. I received only a B, but his teacher gave him an A."

Concerns with fairness between adjudicators/observers and applicants are expected to be different. One reason for it may be related to the influence of outcomes of allocations on people in different roles. For applicants, outcomes of an allocation directly affect them, and thus the outcomes seem to be their largest concern. Whether or not applicants receive the resource seems to affect their perception of fairness to a great degree. On the other hand, because the outcomes of the allocation do not have any direct and immediate influence on adjudicators or on observers, their concern with outcomes may be less than the concern of applicants, and their concern with procedures or principles may be greater.

Most of the social psychological studies on fairness of allocations have examined applicants' concerns with fairness; few have examined adjudicators' and observers' concerns with the fairness of allocations. In this thesis, I would like to focus on adjudicators and observers in order to examine their concerns with fairness of allocations.

My discussion in this thesis will focus on fairness concerns of people occupying these two roles.

2.3 Issues of fairness in adjudicated allocations

Issues of fairness in adjudicated allocations involve at least two different groups of questions. One group concerns decision making in adjudicated allocations: What are the judgment principles and procedures adjudicators employ in making their allocation decisions, what kind of information do they examine, and how do they integrate the information into final decisions? Many fields of social science such as economics and sociology investigate how allocations should be made. However, even if judgment principles and/or allocation procedures are agreed as fair, fair allocations cannot be guaranteed; allocations may still be unfair even if fair principles and the fair procedures are used in the adjudication.

The second group of questions concerns the fairness judgment of allocations. For example, how do adjudicators perceive fairness of their own decisions? Under what conditions do observers judge the allocation as fair or unfair? Allocation decision making and the judgment of its fairness are two closely related but different issues. Adjudicators' ways of making allocation decisions may reflect what they believe to be fair. However, they may also make allocations and justify their decisions but not believe that they are fair; instead, they may rationalize their allocation decisions as if they were fair. Also, observers may think that adjudicators' decisions are unfair even though adjudicators follow the legitimate decision procedures or even though adjudicators justify their decisions. Relationships among adjudicators' allocation decisions, their judgments of fairness, and observers' fairness judgments should be investigated.

2.4 Allocation decision making

Allocation decision making and the scarcity of resources. If everyone who asks for a resource could get what he or she wishes, few problems of resource allocations would exist. Problems emerge when a resource is in short supply in comparison to how much is requested, including problems of allocating the resource in a fair way. The scarcity of a resource may increase for two reasons: (1) supply of the resource may decrease; (2) the demand may increase as it would when more people apply for it.

The scarcity of the resource may alter the priority among different principles in making allocation decisions. When a resource is allocated, adjudicators often expect that the resource will be utilized and will contribute to individuals or society. They do not want to waste the resource, especially if it is scarce. When resources do become scarce, adjudicators may turn their attention to efficient use of resources and then to applicants' abilities to use resources. That is, as resources become more scarce, it may become more important to allocate the resource according to applicants' abilities or contributions (i.e., ability-based or contribution-based principles), rather than to distribute the resource according to applicants' needs (i.e., a humanistic or needs-based principle). Conflict may emerge between ability-based and need-based principles as the resource becomes scarce whenever those most in need are not the same as those with greatest ability.

Whenever a resource is less than what all applicants request, adjudicators must determine which applicants will get it and which will not. To do so the adjudicators must first choose the criteria they will use to judge the "deservingness" of the applicants. Good criteria should have two properties: (1) they must be considered as fair in making allocations; (2) they must be able to distinguish the good applicants from the bad ones, that is, have discriminatory validity. Thorngate (1988, 1990) has noted that the criteria used by

adjudicators can lose their discriminatory validity over time for two reasons. First, the adjudication may attract an increasing number of "qualified" applicants. Second, the amount of the resource may decrease. In either case, more than enough applicants may be judged deserving of the resource, and additional criteria may then be employed to make finer discriminations. As more and more criteria are added in this way, the adjudicators may exhaust all fair ones, and final allocation decisions may then be made on the basis of unfair or arbitrary criteria.

The devolution towards unfair or arbitrary criteria can be illustrated by the following example. Suppose that 100 patients are waiting for beds in a hospital but that only five beds are available for the moment. Physicians have to choose a criterion to judge patients. They may begin to judge patients based on the seriousness of conditions. However, if fifty patients are in quite serious condition, physicians need to find another criterion, say the chance of recovery, to screen the remaining patients. The physicians may have to continue choosing criteria: age, sex, income, occupation, address, hobby, etc. in order to eliminate more remaining applicants. As they do so, they may use up all relevant or fair criteria and the remaining criteria are likely to be less and less valid or relevant. It is these invalid or irrelevant criteria that determine the final outcomes of allocations, and the fate of the most deserving applicants. Under these conditions, "final judgements are almost guaranteed to be whimsical or arbitrary regardless of the integrity of the adjudicators" (Thorngate, 1988, p. 10; see also Einhorn, 1978).

Allocation decision making and the applicant population. The applicant population is the second determinant of resource scarcity; when the number of applicants increases and the resource does not, the relative scarcity of the resource also increases. The applicant population may thus affect the allocation decision making as the absolute shortage of resources does. For example, as the applicant population becomes larger, small errors in

judging applicants more often lead to the rejection of the most deserving applicants (Thomgate & Carroll, 1987).

Yet, the increase of the applicant population has at least one characteristic influence on allocation decision making which the absolute shortage of resource does not have. It is an influence on the amount of information available to adjudicators. When the applicant population becomes larger, adjudicators are likely to have a greater amount of information to examine, and the task demands for adjudicators may increase. Adjudicators' attention in examining each applicant may then decrease and errors in judging applicants may increase.

2.5 Fairness judgments.

Information about allocation decisions. Judging the fairness of an allocation seems to depend on several aspects of the allocation. Information about the allocation may be categorized into three groups, corresponding to the three different components in allocation decision making; information about allocation principles, procedures and outcomes. The information about decision principles tells us which distributive philosophy or philosophical outline (e.g., according to applicants' needs, according to applicants' abilities, etc.) is emphasized in the allocation decisions. The information about principles also includes concrete criteria (e.g., income, age, grades) which are considered important to use in the allocation decisions. The information about decision procedures is concerned with the process in making the allocation decisions, such as how applicant information is examined, how applicants are judged on relevant criteria, and how different pieces of information are integrated into a decision. The information about decision outcomes tells us who receives how much of the resource.

Often, when we judge the fairness of an allocation, not all the information about it is available. For example, most feedback about research grant applications tells us only the basic policy of the grant selection committee and whether or not our proposal was accepted.

The committee may report who was accepted but not who was rejected. In immigration selection, a rough sketch of selection procedures is available but we do not know who is accepted or rejected, how each applicant is judged on certain criteria, or how the judgements are integrated for the final decision. If we have all information about an allocation, does it increase or decrease our perceptions of the fairness of the allocation? Which information is more critical to our fairness judgments? Much of my research attempts to answer these questions.

Allocation principles. It seems inevitable that we employ distributive philosophies when creating systems or laws to allocate a scarce resource in society. Furthermore, these philosophies are supposed to be legitimate. The distributive philosophy may be based on needs of applicants or humanitarian consideration, or on merit or accomplishment, or on equal opportunity. Different philosophies such as these are employed differently according to the context of allocation situations. In allocation of research grants, for example, consideration is presumably given to the merit of proposals or studies in terms of their contribution for development of a body of knowledge, whereas in the immigration selection, especially refugee selection, humanitarian consideration is often emphasized.

More than one distributive philosophy may co-exist in a given allocation situation. For example, in allocations of medical care, the patient with the lowest expectation of survival is the neediest only if medical care will help, but not if the case is beyond hope. Many people would agree that the medical care should be allocated according to the patients' needs. However, people may also agree that the limited resource should be used efficiently by allocating it to the patients who have a greater possibility to survive and can contribute to the society after their recovery. Both the need-based and the contribution-based principle may be legitimate but may be practically conflicting. A central issue is how to resolve the conflict.

Societies vary in their economic, political and historical circumstances. Different distributive philosophies underlying allocations often reflect the ideology which is shared in a given society as a result of these different circumstances. For example, in the capitalist societies of North-America and Japan, competition is regarded as the basis for the economic development, and a great concern with efficiency turns our attention to applicants' abilities (Ecknoff, 1974), "track record," or anticipated future returns. However, the same distributive philosophy may have different manifestations in these societies, and the fairness of allocation may be perceived differently as well. For example, in North America, there is a notion that "self" is an important, autonomous entity (e.g., Sampson, 1977). Each individual is entitled to receive what he or she deserves based on his or her own ability. Fairness of allocation would function as a tool to protect individual rights and then people's identity in North America. However, the allocations based on the applicants' abilities can also indicate status of people clearly (Cohen & Greenberg, 1982; Sampson, 1975). In some societies such as in Japan, where a system of strict hierarchy is still dominant (e.g., Hamaguchi, 1977; Hotta, 1989), the fairness of allocations would function better as a tool to maintain the order in the society; people can obtain their identity by knowing their relative positions in their group. Therefore, people in Japan enhance their rewards by fitting themselves to existing realities as they are (Weisz, Rothbaum, & Blackburn, 1984). They are likely to accept differences in what they receive (e.g., Mahler, Greenberg, & Hayashi, 1981) because these differences are necessary for their identity.

Distributive philosophy is often defined more concretely by the criteria which are actually used to judge applicants in allocation decisions. For example, in allocations of welfare, needs may be defined by income; the need-based philosophy may state that welfare must be first distributed to low-income people. The single criterion of income may not be appropriate to reflect needs; the number of dependants or the absence of housing

may have to be added. Some criteria well reflect a distributive philosophy, but others may not. For example, if a criterion such as teaching ability requires subjective evaluation, a more objective criterion (e.g., the number of As given) may be sought. However, the objective criterion may come to poorly reflect the original distributive philosophy over time, resulting in biased allocations (Hotta & Thorngate, 1990).

Allocation procedures. Adjudicators who employ fair distributive philosophies and criteria may still make unfair allocation decisions. The fairness of an allocation can be influenced not only at the abstract level of philosophical principles, but also at mundane level of decision procedures (Deutsch, 1975). Alternative procedures for implementing a given principle often exist, and two different philosophies frequently dictate the same allocation decision (Camerer & MacCrimmon, 1983; Leventhal, 1976).

One difficulty to establish fair procedures to implement legitimated principles stems from the co-existence of different allocation principles. When two principles co-exist, procedures may be required to trade off among judgements based on different criteria. For example, in allocations of medical care, the ability to pay the medical fee (reflecting an ability principle) and the seriousness of disease (reflecting a need principle) may conflict. Another difficulty to establish or maintain fair procedures which reflect legitimate principles is that some of the information necessary for the judgement of applicants may be ambiguous, uncertain, or impossible to obtain. For example, the capability of adjustment in immigration decisions may be an important criterion for selection decisions, but difficult to measure. Some criteria may require subjective judgment of applicants, allowing possible inconsistency in allocation decisions.

Several other procedural aspects of allocation may influence the judgment of fairness even if the outcomes of the allocation do not change. With the same information, the same process to examine applicants, and the same outcomes, perceived fairness of the allocation

may still vary: What if we know that the allocation is made quickly? What if only one adjudicator makes the allocation? What if the adjudicators are not experienced? What if the process of allocation is kept secret?

Allocation outcomes. Even with a fair distributive philosophy, criteria, and procedures, some people may still not judge the allocation as fair. Applicants, for example, may judge an allocation as unfair simply because they do not receive resources. If outcomes are a strong determinant of fairness perception, then in allocations with a large number of applicants or with scarce resources, few applicants will perceive the allocation to be fair; as the resource becomes scarce, more applicants may perceive the allocation as unfair.

Observers may perceive the fairness of allocation according to whether or not applicants who deserve a resource receive it (i.e., no omission errors) and whether or not those who do not deserve the resource do not receive it (i.e., no commission errors). If a resource becomes more scarce through its reduction or through an increase in the applicant population, the possibility of omission errors (i.e., deserving applicants do not receive the resource) increases. So if outcomes are the important determinant of fairness perception, observers may perceive less fairness as resources decline or as an applicant population increases.

Adjudicators' concerns. What kinds of concerns do adjudicators have in making allocations? How do they perceive the fairness of their own allocations? How are their perceptions related to their decision making? Adjudicators may be motivated to be fair in making allocations, and they may perceive their allocations to be fair. On the other hand, they may simply wish to get the job done with little concern for fairness.

In adjudicated allocations, adjudicators' motivation to be fair is unlikely to be related to the maximization of their own immediate outcomes, because fairness does not bring any

gain or loss of the resources to them. It cannot be denied, however, that adjudicators may be sooner or later affected by the fairness of their allocations. For example, adjudicators may be motivated to be fair considering the possibility that they may become applicants in the future. Alternatively, unfair adjudicators may eventually lose their adjudicative position. In most societies, there is an expectation for adjudicators to be fair. When a resource is scarce, it is impossible for adjudicators to meet this expectation if only the outcomes of allocation are considered, because not every one can receive the resource that he or she expects. Therefore, the best that adjudicators can do is to emphasize the fairness of their allocations principles and procedures rather than the fairness of their allocation outcomes.

Adjudicators may be motivated to be fair in making allocations, but their allocation decisions may or may not be fair. They may believe their allocation decisions fair as far as they are satisfied with their own decision processes, such as because they had considerable information available in making decisions, because they spent a lot of energy (time, examination of information, discussion) in their allocation, because they think that their decision process was efficient, because they have a lot of experience with the same or similar allocation decisions, or because they have previously employed the same principles and procedures and have not received any complaints about them.

Adjudicators may be concerned with fairness of allocation, but may not wish to make the effort to be fair; they may dislike the allocation task and wish to complete it as soon as possible. They may know that their allocation decisions are unfair but may simply rationalize them instead of making efforts to make fair allocations. However, because adjudicators are expected to be fair, they have to justify or rationalize their decisions. For example, no matter how little time they spent in making allocation decisions or how little information they examined, adjudicators may emphasize the amount of and time effort they

invest for their allocation decisions. A typical justification by adjudicators is "The following applicants have been chosen after extensive examination of applicants." In justifying the decisions, adjudicators often note that a resource is scarce. They may persuade an applicant, especially, who receives less of the resource than what he or she expected. Adjudicators may tell such an applicant that many other applicants were also rejected, because the resource is so limited. Or, the justification of the allocation decisions (e.g., governmental reports on immigration process, editorial reports of journal reviews) is often concerned with legitimate distributive philosophy approved by public. Which aspects in the allocation decision making would be emphasized by the adjudicators to justify their decisions and how much their justification reflects what they in fact did in making decision should be investigated.

Observers' concerns. What kinds of concerns do observers have in judging the fairness of allocation decisions? Like adjudicators, observers' concerns with the fairness of allocation are unlikely to stem from the maximization of their own outcomes because outcomes do not directly influence them. However, observers do not have responsibility for the allocation decisions. If observers have no vested interests, they may care little about fairness of allocation. But, if they have close relationships with applicants or adjudicators, they may have defensive interests in the evaluation of fairness. Observers may desire to maintain fairness in society thinking of the future or of similar allocation situations where they become applicants (Lerner, 1975, 1977). As mentioned earlier, preference for or dominance of a distributive philosophy is likely to reflect values and ideologies in a society. Observers may judge the fairness of allocations based on the shared value acquired through the socialization process (Lerner, 1977; Rubin & Peplau, 1975).

Observers' own experiences as adjudicators in another allocation may be used as criteria to judge the fairness of allocation. Judgments tend to be relative and thus require a

standard of comparison. The frames of reference for fairness judgment are often similar cases of the observers' own experiences. Observers may perceive the fairness of allocation decisions based on principles and procedures that they would employ if they made allocations. If an adjudicator made allocations in a very similar way as an observer would do or did in another allocation, this observer may judge the adjudicator's allocations fair just because they are similar. Whether their similarities in the allocation decision influence on the fairness judgments should be examined.

Chapter 3: Social Psychology of Adjudicated Allocations

3.1 Relevant research areas of social psychology

As I mentioned above, there are many interesting questions about how adjudicators make allocation decisions and how adjudicators and observers judge the fairness of allocations. What kinds of answers or clues can social psychologists offer to these issues? There seem to be three research fields in social psychology relevant to these issues: 1) distributive justice; 2) procedural justice; and 3) human decision making.

3.2 Distributive justice

What questions have been addressed? Social psychologists have been interested in "justice" or "fairness" of allocations at least since the 1960s (e.g., Adams, 1965; Blau, 1964; Homans, 1961). Early work in this area investigated fairness in exchange activities, typically by asking one of two or more persons to divide a limited resource (often rewards) among him/herself and the other(s). Homans (1961) discussed the concept of "distributive justice" in exchange relations of people, stating that an individual who participates in exchange activity with others would expect a certain amount of reward (output) in proportion to his or her own investment (input). He argued that unexpected reward, under- or over-reward, would induce emotional behavior such as anger or guilt. Blau's (1964) exchange theory, and later Adams' (1965) "equity theory", reflected Homans' concept of justice by defining it as an individual's expectation of what he or she should receive. Adams' equity theory, incorporating social comparison theory (Festinger, 1954) and cognitive dissonance theory (Festinger, 1957), has stimulated many social psychologists to study distributive justice as a set of norms governing allocation behavior. The distributive

justice studies published between 1970 to 1975 focus on the identification of various distributive principles, such as "according to needs" and "according to abilities" (e.g., Deutsch, 1975; Lerner, 1974; Sampson, 1975; Walster, Berscheid, & Walster, 1973) - what I call distributive philosophy - and preferences for or dominance among these principles (Deutsch, 1975).

Later, many researchers attempted to identify variables which affect the employment of the distributive principles (mostly in exchange activities, that is, allocating resources between allocator him/herself and others). These variables include the scarcity of resources (e.g., Coon, Lane, & Lichtman, 1974; Greenberg, 1979; Hegtvedt, 1987; Lane & Messé, 1972), the relationship among allocators and other applicants (e.g., Lamm & Schwinger, 1980; Okuda, 1984, 1985), the secrecy of allocation (e.g., Leventhal, Michaels, & Sanford, 1972; Reis & Gruzen, 1976), future interaction between allocators and applicants (e.g., Greenberg, 1979; Shapiro, 1975; Matsuzaki, Aikawa, & Ueno, 1980), the contexts of allocation (i.e., organization, family, etc.) (e.g., Deutsch, 1987; Saito & Sasaki, 1987), and allocations in groups (e.g., Greenberg, 1979; Tindale & Davis, 1985). Studies of distributive justice have also examined motives to be just (e.g., Lerner, 1975; Rubin & Peplau, 1975; Brickman, 1975; Cohen, 1979) and functional aspects of justice, such as altruistic allocation aiming at impression management (e.g., Leventhal, 1976).

What are some representative findings? Three allocation principles dominate discussion in the research area of distributive justice: equity, equality and need. When using the equity principle, resources are allocated according to the merit or contribution of applicants (Adams, 1965). The need principle guide to allocate resources based on needs of applicants (e.g., Schwartz, 1975). If the equality principle is employed, resources are allocated equally among applicants regardless of need, merit or anything else (e.g., Deutsch, 1975). Most researchers argue that all of these principles are employed to some

degree, and that the dominance of one over another is largely dependent upon the allocation situation (cf. Walster, Berscheid, & Walster, 1973).

Among many studies of the effects of situational and social variables on the preference for or dominance of distributive principles, resource scarcity has been one of the concerns. The degree of scarcity has been found to shift the dominant principle in allocations. For example, Greenberg (1979, see Greenberg, 1981) found that the need principle is more salient over the equality principle when a resource is scarce. Karuza and Leventhal, (1976, see Leventhal, 1980) found that children are more likely to allocate a resource among others according to their needs when the resource becomes more scarce. It was also found, however, that the scarcity of resources increasingly emphasizes the equity principle (e.g., deCarufel, 1981; Saito & Sasaki, 1987).

Studies of distributive justice have also considered social factors affecting allocation principles. Cross-cultural studies, mostly between North American societies and Asian or European societies, (e.g., Berman, Murphy-Berman, & Singh, 1985; Leung & Iwawaki, 1988; Taormina, Messick, Iwawaki, & Wilke, 1988; Törnblom & Foa, 1983) show that the relative importance or preference between needs and merits varies in different cultures. For example, in comparison to Americans, Japanese people prefer the equality principle showing less concern with equity (Mahler, Greenberg, & Hayashi, 1981). Americans prefer the need principle less than Indians (e.g., Berman, Murphy-Berman, & Singh, 1985). In general, in North America, equity based on merit is considered as a fair principle of allocation (e.g., Deutsch, 1987).

Gender differences have also been examined in the studies of distributive justice. Males and females are found to have different preferences for distributive principles. Leventhal, Popp, and Sawyer (1973), for example, found that males tend to allocate resources according to the equity principle, whereas females tend to allocate them according

to the equality principle. Among several possible explanations for the gender difference in allocation behavior, Kahn and Gaeddert (1985) suggest that males and females tend to show different allocations possibly because of their different perception of what should be input and what should be output to use in calculating equity. For example, men may be more likely to consider ability or skill as relevant criteria, and because these differ across individuals, they allocate a resource equitably. Women may be more likely to consider participation as the most relevant input, and if this is equal for all individuals in the group, they may allocate the resource equally.

Research on the justice motive has developed some models and examined these empirically. For equity theorists such as Adams (1965) and Homans (1961) the motive to be just is not "to achieve justice" but "to avoid unjust outcomes" (Mikula, 1984). On the other hand, Lerner, Miller, and Holmes (1976) state that an individual learns to be just for his or her own future outcomes - to apply to others the rule that people should get what they deserve because the rule will guarantee his or her own gain in future. For these theorists, the motive for justice is a product of a social contract among self-interested individuals in the society. The difference in Lerner's idea from older equity theorists is that the motive for justice is "pro-active" to establish just status and conditions in society rather than simply to avoid unfair outcomes (Mikula, 1984).

Some studies of the justice motive indicate that people are egoistic by nature (e.g., Greenberg & Cohen, 1982; Leventhal, Karaza, & Fry, 1980; Mikula, 1984; Reis & Gruzen, 1976; Rivera & Tedeschi, 1976). Although other studies found some altruistic allocations, these allocations were interpreted as a means of impression management by allocators. For example, if future interaction is expected between allocators and others, allocators distribute a resource in favour of others (Austin, 1980; Greenberg, 1979; Hegtivedt, 1987; Shapiro, 1975), expecting self-gain in the next allocation. These studies

suggest that we may appear just in action but care only for ourselves in motivation (Batson, 1990).

In contrast to the majority of studies, there is evidence that people have some ideas concerning justice apart from conscious self-interest. People perceive certain distributions of resources fairer than others even if they do not know applicants' abilities, attributions nor needs (e.g., Brickman, 1975; Brickman & Bryan, 1975; Rawls, 1971); they have a general preference for equality *per se*. For example, Brickman (1975) assigned money to four persons so that distribution of the money was either equal among the four (e.g., \$25 for each), negative-skewed (i.e., \$10, \$30, \$30, and \$30), or positive-skewed (i.e., \$20, \$20, \$20, and \$40). He found that the equal distribution was perceived as the fairest. Also, people who received the modal amount of money (i.e., \$30 in negative-skewed and \$20 in positive-skewed conditions) rated the negative-skewed distribution as less fair than positive-skewed distribution. This is an interesting result because subjects in the negative-skewed condition received a larger amount of money (\$30) than in the positive-skewed condition (\$20), and their relative amount to others' is larger in negative-skewed (\$30 for themselves and \$10 for others) than in positive-skewed (\$20 for themselves and \$40 for others). It seems that subjects judged the distribution not only on their own gain nor on its comparison with others' gains, but based on the fairness of the overall distribution configuration.

Some studies suggest that applicants' satisfactions with outcomes are different from their perceptions of fairness of allocation (e.g., Messick & Sentis, 1983; Austin, McGinn, & Susmilsh, 1980). The perception of fairness seems to be influenced by social comparison (i.e., comparison between self-gain with others' gain), whereas satisfaction with outcomes is determined by social comparison and historical comparison (i.e., comparison with own gain at present and own gain in past). In addition, applicants'

perception of the fairness of allocation is based on their own opinions about fair principles (e.g., Okuda, 1984, 1985). If applicants believe that the equality principle should be employed in a certain allocation, they perceive that the adjudicators who apply the equality principle are fairer than the adjudicators who apply the equity principle.

Implications. Perhaps because the early social psychological works (e.g., Adams, 1965; Homans, 1961) dealt only with exchange situations in which one allocates reward between him/herself and the other(s), most of the later studies have studied distributive justice only in this particular allocation situation (Deutsch, 1987). Attention has focused on the allocators' reward distribution between two persons (or occasionally three or four) including the allocators themselves. The situation normally examined in this social psychological research is only one of several that can generate unfair experiences in the real-world (Gorden & Fryxell, 1989; Mikula, 1986). There are many other types of allocation situations besides this simple exchange situation; one, of course, is the adjudicated allocation.

Another limitation of studies of distributive justice is related to the motives to be just. Why do people care about justice? Most studies of distributive justice seem based on a particular ideology of the self, as self-contained and egoistic (e.g., Batson, 1990; Hogan & Emler, 1978; Sampson, 1977). Because of this ideology, motives for justice are searched for in the maximization of self-interest in "outcomes." In adjudicated allocations, adjudicators and observers are less likely to be motivated by self-interest in resources because by definition they gain none.

In spite of these limitations, the basic ideas about distributive principles in these studies are useful to consider for understanding adjudicated allocations. Findings using the self-involving allocations suggest analogous questions concerning adjudicators and observers in adjudicated allocations. Similar trends in preferences for distributive

philosophies may be found in observers and/or adjudicators. Males and females may focus on different information about applicants and allocate a resource differently, and they may show different judgement of the fairness of allocations. The scarcity of resources may affect the preference for distributive philosophies and the fairness judgments of adjudicators and observers, as found in the studies about allocators and applicants in the self-involving allocations. Alternatively, because justice motives of adjudicators and observers may be different from those of applicants (i.e., the maximization of own gain of resources), different trends may be found in adjudicators and observers. In addition, studies of differences between applicants' fairness perception and their satisfaction with allocation suggest questions such as: Are adjudicators' fairness perceptions different from the satisfaction with their decisions? Are their perceptions of fairness and satisfaction based on different criteria?

3.3 Procedural justice

What questions have been addressed? Even if certain principles are regarded as legitimate, outcomes may vary depending on evaluations of applicants on the selected criteria and their integration into final allocation decisions (see Camerer & MacCrimmon, 1983). The above studies of distributive justice focus on principles (i.e., how a resource should be allocated) and outcomes of allocation decisions (i.e., how much of the resource is allocated to whom). Other studies of justice in social psychology focus on the allocation process (i.e., how the decision was made to allocate the resource). The latter are called studies of procedural justice in contrast to distributive justice. Research on procedural justice was begun by Thibaut and Walker (1975) using a courtroom dispute-resolution setting. Since then, studies of procedural justice have extended to leadership evaluation (e.g., Tyler & Caine, 1981), intervention in grievance system (e.g., Gordon & Fryxell, 1989), organizational settings (e.g., Sheppard & Lewicki, 1987, see Barrett-Howard &

Tyler, 1986) and evaluation of political authority (e.g., police; see Tyler, 1988). The main objectives of these studies of procedural justice have been to examine the relative importance of procedures versus outcomes in fairness judgment and to identify the features of procedures which affect the judgment of fairness.

What are some representative findings? Studies of procedural justice by Thibaut and Walker were concerned with how procedures in dispute-resolution situations influence the fairness perception of interested parties. They considered the distribution of control between interested parties and the adjudicator (judge) as a key determinant of the interested parties' perception of fairness. Thibaut and Walker (1975) distinguished two types of control: process control and decision control. Process control refers to control over the presentation of evidence and arguments, whereas decision control refers to control over the judgment to be made. These two controls are related to different legal systems: 1) the inquisitorial system, in which both process and decision are under control of adjudicators; 2) the adversary system, in which the decision is controlled by adjudicators but the process (e.g., investigation) can be controlled by interested parties. Studies comparing these two legal systems (e.g., LaTour, 1978; Walker, LaTour, Lind, & Thibaut, 1974) conclude that process control is more important than decision control in the perception of fairness.

Decision control is related to distributive justice, whereas process control is related to procedural justice, and the first aim of studies of procedural justice has been to indicate the relative importance of procedures over outcomes in the perception of fairness. Procedural justice has been found to function as "a cushion of support" (Murphy & Tanenhaus, 1969) when the outcomes are unfavorable to interested parties. For example, the fairness of procedures increases judgements of overall fairness, increases satisfaction with the outcomes (e.g., Thibaut & Walker, 1975; Tyler, 1988), facilitates acceptance of the outcomes, increases the evaluation of adjudicators (e.g., Tyler, 1984), and reduces

hostility against authority and systems (e.g., Tyler, 1984). The most interesting idea derived from these studies is the possibility that "the use of a fair procedure can increase the satisfaction of all concerned without any increase in the real outcomes available for distribution [emphasis in original]" (Lind & Tyler, 1988, p. 29).

The second aim of the research on procedural justice has been to identify the features of procedures that most influence fairness perception. For example, Thibaut and Walker (1975) and Tyler, Rasinski and Spodick (1985) identify the opportunity to express opinions (voice) as the most critical aspect of process control, and thus of procedural justice. Leventhal (1980) suggests six procedural criteria which procedures must satisfy to be perceived as fair: 1) consistency in procedures across time and person; 2) suppression of bias due to self-interest and blind allegiance of adjudicators; 3) quality of decisions; 4) availability of systems to modify and change the decisions; 5) representation of basic concerns and values of any subgroup affected by the decisions; and 6) maintenance of ethicality. Among these dimensions, consistency has been found as the most significant in affecting the perception of fairness and the satisfaction with decisions (e.g., Fry & Chaney, 1981; Fry & Leventhal, 1979; Sheppard & Lewicki, 1984, see Barrett-Howard & Tyler, 1986). In a competitive situation, the quality of decisions, such as the accuracy of information examined, was also found important. (e.g., Barrett-Howard & Tyler, 1986; Fry & Leventhal, 1979, see Tyler, 1988).

Research on procedural justice has been extended from dispute resolution in court setting (e.g., Thibaut & Walker, 1975) to the evaluation of leadership (e.g., Tyler & Caine, 1981) or political authority (e.g., Tyler, 1988). For example, Tyler and Caine (1981) found that fairness of procedures strongly influence citizen evaluations of political leaders or students' evaluations of their teachers, and that this influence is independent of the levels of outcomes the citizen or the students received (e.g., more than deserving, just

deserving, or less than deserving).

Although studies of procedural justice have been numerous, few have examined issues of procedural justice in adjudicated contests where the amount of a resource is limited. Barrett-Howard and Tyler's (1986) study is an exception. They examined the relative importance of procedural and distributive justice using hypothetical scenarios of simple adjudicated contests. Barrett-Howard and Tyler (1986) asked subjects to imagine themselves participating in an allocation situation in which one adjudicator must allocate a resource between two applicants, then to rate the importance of procedural and distributive justice. They manipulated the relations between two applicants (cooperative versus competitive, and equal versus unequal power) and characteristics of allocations (work-setting versus social-oriented, and formal or rule-defined versus informal or causal). Barrett-Howard and Tyler found that the relative importance of procedural and distributive justice varies with these situational factors. For example, procedural justice is more important than distributive justice, on average, when allocation is formal or when two applicants are in cooperative relations.

Implications. Most studies of procedural justice concern either dispute-resolution in a court setting or evaluation of authorities. These situations are tests according to my preceding definitions; the decisions are not restricted by the amount of resources. Judgments in court for different cases are independent of each other and the judge can make as many judgments of guilt or innocence as he or she sees fit. The interesting idea that people can be satisfied with outcomes of allocation decisions as long as their procedures are fair, even if the outcomes are worse than they expect, may be useful in considering contests for scarce resources. When resources are scarce, not all applicants can have the amount they desire, and thus the fairness of procedures may be important for adjudicators if they wish to make allocation decisions judged to be fair. The fairness of procedures may

increase observers' or applicants' perceptions of fairness of the allocation. This idea should be interesting to examine in contest situations as well as test situations.

Some of the criteria to judge the fairness of procedures examined in adjudicated test situations should be useful for understating adjudicated contests. For example, whether the decision has been made using accurate information has been identified as an important determinant (e.g., Fry & Chaney, 1981 see Barrett-Howard & Tyler, 1986). If observers know how and what information an adjudicator examines to make his or her decisions, observers' judgment of fairness of the decisions may be associated with their evaluation about the adjudicator's information examination.

3.4 Human decision-making

What questions have been addressed? In addition to studies of distributive and procedural justice, much research on human decision making is relevant to our understanding of adjudicated allocations. Allocating resources obviously involves a decision making process, and some social psychologists have begun to realize the importance of decision process for the issues of fairness (e.g., Messick & Sentis, 1983). However, it seems that useful findings, approaches, and paradigms in decision making research have not yet greatly contributed to our understanding about allocation behavior. Many recent studies of decision making investigate decision processes as well as outcomes (e.g., Hotta, 1988; Svenson, 1979; Payne, Braustein, & Carroll, 1978; Payne, 1976; Wright, 1973). The models and findings concerning "process" seem to provide a useful framework for inquiries about the fairness in adjudicated allocations.

Decision making research began with a particular normative principle of decision making (i.e., how decision makers should make decisions to optimize outcomes), which evolved to become the Subjective Expected Utility (SEU) model (e.g., Edwards, 1954). Later, much evidence showed that actual decision making could not be predicted by the

normative principle. Many alternative models of decision making processes have been suggested, most based on the assumption that individuals utilize any of several informal rules or heuristics in making decisions (e.g., Einhorn, 1971; Tversky, 1972; Montgomery, 1984, see Beach & Mitchell, 1978; Montgomery & Svenson, 1976 for summary of different heuristics). Attentions of researchers expanded from the identification of processes people employ in making decisions to the examination of situational factors which lead to the employment of certain decision making processes (e.g., Bettman & Kakkar, 1977; Billings & Marcus, 1983; Huber, 1980; Nakajima & Hotta, 1989; Olshavsky, 1976; Payne, 1976; Russo & Doshier, 1983; Tversky, 1969; Wright, 1973; Zakay, 1985). In parallel, new research paradigms were introduced to examine details of decision making processes (e.g., Einhorn & Hogarth, 1981; Payne, Braunstein, & Carroll, 1978; Rosen & Rosenkoetter, 1976; Svenson, 1979).

What are some representative findings? Studies that examine the effects of situational factors on decision making processes have been concerned with the amount of information (e.g., Billings & Marcus, 1983; Klayman, 1985; Payne, 1976; Olshavsky, 1979; Huber, 1980; Sugimoto, 1983; Hogarth, 1975; Jacoby, Speller, & Kohn, 1974; Onken, Hastie, & Revelle, 1985), time pressure (e.g., Wright, 1973; Ben Zur & Breznitz, 1981; Zakay, 1985; Waller & Mitchell, 1984), similarity of alternative choices (Adelbratt & Montgomery, 1980; Tversky, 1972; Huber, Payne, & Puto, 1982; Shugan, 1980; Pollay, 1970), information display format (e.g., Tversky, 1969; Bettman & Kakkar, 1977; Jarvenpaa, 1990), and significance of decisions (e.g., Smith, Mitchell, & Beach, 1982). The main concerns of these studies are with how situational factors might increase the use of various heuristics for decision making, and how the employment of these heuristics might influence the quality of decisions, the confidence in decisions, or the satisfaction with decisions.

In order to identify various decision heuristics and to investigate shifts in their

popularity of use, decision making researchers have invented methods to observe pre-decision behavior. Many are collectively called "information tracing" methods as they record the information a decision maker examines prior to making decisions (Payne, 1976; Payne, Braunstein, & Carroll, 1978). Among them, the "information display board" method or "information monitoring" method has been often employed. Others are protocol methods (or, thinking-aloud methods) and eye-movement recordings. Subjects faced with an information display board typically see a matrix of covered information cells, each an intersection of one choice alternative (column) and one information item (row). A subject can request information by specifying an alternative and an item of information, and can examine as much or as little information as he or she wants in any order until he or she makes a final decision among the alternatives. For example, in a task to choose a hotel, a subject may be given access to pieces of information about several alternative hotels (e.g., price, size, location, check-out time, with or without bath, parking lot, breakfast, etc.). He or she can continue requesting information ("price of Hotel A", "parking lot of Hotel C", etc.) until he or she can decide which hotel he or she would stay. The sequence of his or her information examination is recorded and analyzed to reveal the features of the decision process employed.

Using information tracing methods, the effects of several variables on decision processes have been examined. One of such variables is the complexity of decision tasks, which is usually defined as the amount of information to be processed in making the decision. It has been found that, as the complexity of decision tasks increases, people resort to simplifying heuristics, because human capacity to process information is limited (e.g., Onken, Hastie, & Revelle, 1985; Payne, 1976). For example, when people have more alternatives to consider, the total amount of information available to consider increases. One would expect that if people have more information, they would examine it.

However, people usually do not increase the amount of information they examine as much as the information increases, but instead examine only a fixed amount of it (e.g., Payne, 1976; Lussier & Olshavsky, 1979; Klayman, 1985). Also, the time spent making decisions does not increase at the same rate as the information increases (e.g., Hendrick, Mills, & Kiesler, 1968; Hogarth, 1975; Onken, Hastie, & Revelle, 1985).

The type of heuristics people employ has also been a popular research concern. In decision making research, heuristics are classified into two general categories: alternative-by-alternative and item-by-item (e.g., Montgomery & Severson, 1976; Payne, 1976; Olshavsky, 1979). People using a prototypical alternative-by-alternative heuristic examine all the information items of one alternative before looking at another. For example, if someone has to decide which apartment he or she rents, she or he may prepare a list of items she or he thinks important to consider (e.g., rent, size, type of floor, parking lot, with or without terrace, the nearest grocery store, neighborhood, etc). Every time he or she visits an apartment, she or he might evaluate it along these items on her or his list. After she or he visits several apartments, he or she may choose the best apartment overall.

In contrast, people employing a prototypical item-by-item heuristic¹ examine alternatives across one (usually important) item of information, often eliminating some unsatisfactory alternatives, before examining the remaining alternatives on another item. For example, the apartment hunter may have a list of information about different apartments

¹Two types of the item-by-item heuristics are generally considered in decision making research (e.g., Payne, 1976); additive difference heuristic (Tversky, 1969) and elimination-by-aspect (EBA) heuristic (Tversky, 1972). However, the former is considered mainly for the decision situation with only two alternatives. In this sense, the latter model is more general heuristic, and thus the item-by-item heuristic refers to the EBA model in this thesis.

along several items. He or she may start with the rent as an item to consider and decide its critical range (e.g., between \$600 and \$800), then eliminate those whose rents are above or below that range. He or she repeatedly chooses important items to consider the remaining apartments and eliminates some until one apartment is left. When a decision task is more complicated (there are more alternatives, alternatives are similar to each other, there are more items of information, etc.), people are more likely to employ item-by-item heuristic to eliminate alternatives (e.g., Payne, 1976; Olshavsky, 1979). This heuristic is also often employed in early stage of decision making because it is useful to reduce the number of alternatives quickly (Dahlstrand & Montgomery, 1984).

Although item-by-item heuristic may be useful to reduce the number of alternatives quickly, it often leads to premature exclusion of alternatives judged low on only one information item; once an alternative is eliminated, any remaining positive aspects will never be examined. Because of this non-compensatory feature, item-by-item heuristic may result in quite different outcomes depending on the order of items chosen. For example, suppose that two items, convenience of transportation and good-neighborhood, are almost equally important in choosing an apartment. Apartment A is located in a moderately convenient area and moderately good neighborhood, whereas B is in slightly more convenient area but its neighborhood is much worse. If the convenience of transportation is arbitrarily considered first, apartment B will be chosen even though its neighborhood is extremely bad and though apartment A may be better overall. Another decision maker may think that neighborhood is only slightly important, and apartment A will be chosen, and outcomes will be different across decision makers. This is an extreme example, but when two or more items are equally important, the employment of an item-by-item heuristic may result in quite different choices.

For many reasons, as the decision process is simplified by reducing mental efforts in

processing information, the quality of decisions is assumed to decrease (e.g., Beach & Mitchell, 1978; Christensen-Szalanski, 1980). For example, Jacoby, Speller, and Berning (1974) found that decision errors increase when more information is available and more simplification of decision processes is necessary. However, they also found that people were more satisfied with and confident about their decisions when more information was available. Decision confidence does not seem to vary according to the use of the heuristics (e.g., Klein, 1983); satisfaction with or confidence about the quality of decisions remains regardless of their actual quality.

Implications. The concept of procedures in allocation decision making is somewhat vague. Procedures seem to lie somewhere between principles and outcomes. Decision making research can offer one definition of procedures, namely, the pattern of information examination and its integration into a final decision. With the information seeking methodology developed in decision making research, the analysis of decision processes can offer a new perspective in research on adjudicated allocations.

The findings of decision making research can be applied to some issues in adjudicated allocations. The effects of the increase of alternatives on information examination may be observed when the applicant population in an allocation (the number of applicants) increases. As the applicant population increases, adjudicators may more often eliminate applicants by employing the item-by-item examination of information. The examination of information about applicants may not increase as much as the available information increases.

If applicants are eliminated by the item-by-item heuristics, the outcomes may be different depending on which item is considered first. In the allocation contexts, as mentioned earlier, it seems common that more than one distributive philosophy are considered legitimate, and one distributive philosophy may be only slightly more important

than another; the priority of one over another may be arbitrary. Suppose that an adjudicator thinks that two distributive philosophies should be considered for fair allocation (e.g., applicants' needs and abilities), and that he or she chooses two items (e.g., financial status and GPA) to reflect these philosophies. Applicant A may have a moderately high GPA and need financial support moderately, where as applicant B may have slightly lower GPA than applicant A but need the support badly. If the adjudicator considers GPA first, applicant A is selected over B, although B has strong needs of financial support. If, in principle, "both" abilities and needs should be considered in the allocation, this decision may be procedurally unfair.

The results of decision making research further suggest that, even if adjudicators simplify their decision processes (e.g., examining only a small amount of information), the simplification may not affect their fairness judgment. They may be satisfied with their allocation decisions regardless of how little information they consider or how little time they take to decide.

Decision making research hints at variables that seem to influence observers' fairness judgment of adjudicated allocations. For example, people generally believe that the more information they have, the better decisions they can make, and this may be reflected in the fairness judgment by observers. When observers know that adjudicators examine more information, they may conclude that the allocation is fairer. Or, even simply when they know that there was more information available, they may judge the allocation to be fairer.

Chapter 4: Research Questions

4.1 Summary

Many studies have been done about exchange activities (i.e., allocation of rewards between "you and me"), but not about adjudicated allocations. Many studies have been done on applicants who are strongly concerned with their own gains, but not on adjudicators nor observers who have no direct interests in the outcomes of an allocation. Many have been done on procedures of adjudicated allocation in test situations (e.g., dispute resolutions in court setting), but not in contest situations with limited resources. And many studies have been done on the judgment of fairness, but not on the processes of making allocation decisions. There has been little research in psychology which directly examines questions about allocation decision making and judgment of fairness in adjudicated contests. However, studies of distributive and procedural justice as well as human decision making have interesting implications for research questions on the judgment of fairness and decision making in adjudicated contests. Examination of many issues of fairness of allocation decisions provides us with new perspectives on how adjudications are conducted and how adjudicated contests are judged as fair or as unfair.

4.2 Overview of the studies

The first purpose of my research was to examine the decision processes that adjudicators use to allocate a limited resource to applicants. Particular emphasis was placed on how much and which kinds of information adjudicators examine in making allocation decisions, how their ways of examining the information are related to their fairness judgments, and how their ways of making decisions are related to their fairness judgements.

The second purpose of my research was to determine whether allocation decision making changes as resources become more or less scarce, and whether the judgment of fairness of allocations also changes. This particular situational variable was selected for the present studies because resource scarcity is a critical factor in allocations. It is the scarcity of resources that increases difficulty to make all people satisfied with the allocation decisions. The third purpose of my research was to examine effects of expanding applicant population in allocations on adjudicators' allocation decision making. This variable was selected because, as discussed earlier, the applicant population influences not only the degree of scarcity but also information load of adjudicators.

The fourth purpose of my research was to examine how observers evaluate the fairness of allocation made by adjudicators. Justice research suggests the procedures may be more important than outcomes or principles in assessing the fairness of allocation, especially for applicants who receive less than they expect. In the present studies, this idea was examined in terms of observers who judge the fairness of adjudicated allocations, that is, whether the fairness of procedures of the allocation decision is more important than the fairness of outcomes or principles for observers.

The fifth purpose was to examine whether there are gender differences in making allocation decisions and in judging the fairness of different aspects of adjudicated allocations. In particular, many studies of distributive justice have suggested that men tend to emphasize the ability principle more than women when they allocate a resource between themselves and others. Analyses were conducted to examine whether this tendency was observed in the adjudicated allocation, and if so, whether this difference would influence their decision making processes as well as their fairness judgments.

In two studies reported here, the allocation of student loans was selected as the decision task. This task was relevant to university students who were subjects in the

present studies, and stimulated their interest and motivation.

4.3 Study 1: Decision making for fair allocations

Purpose. The purpose of Study 1 was to examine how adjudicators allocate a limited number of loans among applicants, how they judge their own allocation decision, how the applicant population (i.e., the number of students applying for loans) and the scarcity of loans (i.e., relative shortage of loans to the applicant population) affect the adjudicators' allocation decision making and their fairness judgement, and whether there are gender differences in their allocation decision making. In order to examine their decision process to allocate loans, subjects were asked to request information about applicants, and the content and the sequence of their requests were analyzed.

Hypotheses. Because each applicant was represented as a fixed set of application items, the amount of information available to adjudicators increases as the applicant population increases. Decision making studies (e.g., Hogarth, 1975; Onken, Hastie, & Revelle, 1985; Payne, 1976) report that people do not increase their information examination as much as the increase of information available to them. Based on this finding, I hypothesized that adjudicators would overlook or ignore more information as the applicant population increased. Some studies (e.g., Jacoby, Speller, & Berning, 1974; Jacoby, Speller, & Kohn, 1974) report that people are often more confident in their own decision with more information available, although they may not examine all the information and their decisions may not in fact be better. I also hypothesized that they would perceive their decisions fair regardless of how much information they actually examined, but may perceive them fairer when they have more information available to them.

As a resource becomes scarce or as an applicant population becomes larger, more applicants must be rejected. Decision making studies (e.g., Montgomery & Severson, 1976; Olshavsky, 1979; Tversky, 1972) argue that people often employ the item-by-item

heuristic to eliminate alternatives from further consideration based on application items important to them. When the degree of scarcity became greater and/or when more people are applying for the resource, adjudicators should eliminate more applicants. I expected that adjudicators would focus on items more often to eliminate applicants from consideration and examine only certain applicants in detail but not others.

Studies of procedural justice argue that fairness of procedures may be useful for adjudicators to satisfy applicants when the allocation outcomes are not satisfactory for the applicants. Thus, I hypothesized that procedural fairness would be more influential for adjudicators in justifying their allocation decisions than fairness of outcomes and principles.

4.4 Study 2: Observers' fairness judgments

Purpose. The purpose of Study 2 was to examine how observers judge the fairness of allocations made by adjudicators in Study 1. In particular, Study 2 examined the effects of three different types of information about adjudicated allocations on observers' judgments of fairness: 1) information about the adjudicators' principles of allocation (i.e., which distributive philosophy and which application items are emphasized); 2) information about the adjudicators' allocation procedures (i.e., the content and the order of information examination and when applicants are accepted, rejected or reconsidered); and 3) information about decision outcomes (i.e., which applicants are given the resource).

Study 2 also examined whether adjudicator-observer similarities in their allocation principles, procedures, and outcomes influence observers' judgments of fairness of allocation decision. Every subject who participated in Study 1 as adjudicator served as an observer in Study 2. Adjudicators were paired, and each was asked to read the allocation principles and/or observe recordings of the processes and outcomes of the other. Similarities of principles, procedures and outcomes could then be estimated from the results

of Study 1, and these similarities could be related to fairness judgements in Study 2. In order to examine whether procedures in making allocation decisions would increasingly influence the fairness judgment as a resource becomes scarce (Lind & Tyler, 1986), the effects of resource scarcity and of the applicant population on judgments of fairness of the adjudicated allocation were also analyzed.

Hypotheses. Studies of procedural justice suggest the importance of procedures on judgments of fairness. According to their results, I predicted that observers would judge the fairness of allocation decisions mainly based on their judgments of procedural fairness. In addition, if the fairness of procedures is very important for observers, they may judge the overall fairness of allocation decisions less fair without knowing how the adjudicator made decisions.

Because previous research indicates that most people consider their judgements to be fair, I also predicted that the similarity of allocation decisions (principles, procedures, and outcomes) between observers and adjudicators would increase the observers' judgment of fairness about allocation decisions by the adjudicators. If procedures are most critical for the fairness judgment, the similarity of procedures between observers and adjudicators should influence the fairness judgment of observers most.

Chapter 5: Methods of Studies

5.1 Methods of Study 1

Subjects. Subjects were 72 Carleton University undergraduate students (45 males and 27 females from age of 19 to 45) enrolled in Introductory Psychology. All of them received one hour of experimental credit as requirement for their course by participating in Study 1.

Design. A 2 x 2 factorial design was employed for Study 1. The first independent variable was the degree of scarcity defined in terms of the proportion of loans to applicants. Two levels of scarcity were employed. In the high scarcity condition, the ratio of the number of loans to the number of applicants was 1/8, while in the low scarcity condition, the ratio was 1/4. The second independent variable was the applicant population of the adjudicated contests. In the small population condition, subjects judged the loan applications of eight students, while in the large population condition subjects judged sixteen students. The four conditions are shown in Table 5.1.

Procedure. The 72 subjects were randomly assigned, 18 per condition, to one of the four conditions mentioned above and participated individually. A subject met the experimenter in the experiment room (an office at Carleton University) and seated him/herself on a chair in front of the desk on which a Macintosh computer was placed. The experimenter introduced herself to the subject and noted that there would no deception and discomfort associated with the experiment and that he or she could withdraw from the experiment at any time. The subject was told that the experimenter wanted him or her to return to a second session of this study a few days later¹.

¹The subjects had been informed that this study would contain two sessions when the

Table 5.1. Experimental design of Study 1

Scarcity	Applicant Population	
	Small (8 applicants)	Large (16 applicants)
High (ratio = 1/8)	Cond. 1	Cond. 3
	1 loan & 8 applicants	2 loans & 16 applicants
Low (ratio = 1/4)	Cond. 2	Cond. 4
	2 loans & 8 applicants	4 loans & 16 applicants

study had been advertised to the students.

Each subject was told that the study concerned the allocation of student loans, and that his or her task would be to decide which applicants should receive loans (each loan was worth \$6,000 for one academic year) offered to undergraduate students. The subject was also told that the number of loans available (1, 2, or 4) and the number of applicants he or she would examine (8 or 16). The experimenter told the subject that the information in the application forms of all applicants was stored in a computer data base and that a special data search programme was now running on the computer in front of him or her.

The applicant information had been collected from undergraduate students at Carleton University in October, 1989 as part of a pilot study. Sixteen students voluntarily and anonymously completed a student loan application containing items from several real loan forms. Each application consisted of 21 items² about each applicant, such as sex, birth date, plans for future, GPA of the last year, self-evaluation of seriousness of purpose, total net income of last year, investments, contribution from parents, estimated expense for one-year study, etc. (see Appendix A).

The experimenter showed the basic operations of the computer and mouse necessary to examine the information of applicants. For practice, the subject tried a short allocation task, using a small set of information about applications for parking space, so that he or she could learn how information would be displayed on the computer screen, how to examine information, and how to make decisions.

²In the pilot study, 38 items were included in the application form. In another pilot study, subjects examined the information of 38 application items and made allocation decisions. The result showed that some items were not frequently examined. Based on this result, 17 items were eliminated to reduce the amount of information so that subjects could complete the allocation task in one hour.

An example of the display on the computer screen is shown in Figure 5.1, in this case an example of Condition 2 (2 loans for 8 applicants). In the row above the blank box, "Applicants," alphabets, A to H, were listed as applicants' names. In the column on the right of the box, "Questions," 21 application items on the application form were listed. In the blank box, the information appeared when the subject specified which applicant and which item he or she wished to examine and pressed the return key. The specified applicant was marked with a black dot above the alphabet. The subject could move this dot by using right- and left- arrow keys on keyboard. Similarly, the specified item was marked with a black dot on the left of the item, and the dot could be moved by using up- and down-arrow keys. On the line above the information box, there was a notice of the selected applicant and item (e.g., B's Description of Need).

At any time of information examination, if the subject wanted to accept the applicant he or she was examining, he or she could do so by pressing "+" key when the black dot was over the applicant alphabet, and the "+" mark appeared under the applicant alphabet, in the row of "Decision." This was the same to reject ("- " key). The subject could reconsider his or her decisions (i.e., accept or reject) by pressing "*" key, and then "+" or "-" mark was erased. The subject could also change the decision between "accept" and "reject" simply by pressing the corresponding decision keys. However, the subject could not accept more applicant(s) than the number of loans available, which was shown in the upper in the display, "to give = 2." That is, if the subject had already accepted two applicants but another seemed better, he or she had to cancel at least one of the applicants he or she had accepted. When the subject thought that his or her selection was completed, he or she could type "Q" to quit the task (see Appendix B for the computer program).

CHOICES		
* awards: to give = 2 given = 1	* key = reconsider + key = accept - key = reject	L & R arrows = applicants U & D arrows = questions Return key = answers
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;">•</p> <p>Applicants: A B C D E F G H</p> <p>Decision: - +</p> <p>B's Description of Need:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Although I have investments, I cannot touch that money. Therefore, I rely on what I make and what my parents give me. I do not like the money from them each school yr. I have accepted less and less from them. This is why help financially will make a difference.</p> </div> </div> <div style="width: 45%;"> <p>Questions:</p> <ul style="list-style-type: none"> Sex Birth Date Marital Status GPA(%) in High School Full/Part Time in the Program Description of Studies Plans for Future GPA(%) of the last year Extracurricular Activities Latest Employment Gross Salary (per week) Selfevaluation-Academic Achievement Selfevaluation-Seriousness of Purpose Income(Last Yr)/Summer Employment Income(Last Yr)/While Studying Income(Last Yr)/Contributions/Parental Investments Total Net Income/Last Yr's Tax Return Estimated Study Expenses Estimated Living Expenses • Description of Need </div> </div> <div style="margin-top: 20px;"> <p>Type 'Q' when you complete your decisions</p> </div>		

Figure 5.1. An example of the display on the computer screen.

Every input from the keyboard that the subject made was recorded in a data file giving a complete list of his or her information examination and choice behavior. The file was used for two purposes: 1) for data analyses; and 2) for "playback" to an observer in Study 2.

After answering questions, if he or she agreed to participate in the study, the experimenter asked the subject to complete an "Informed Consent Form" (see Appendix C). Those who agreed were asked to complete a pre-decision questionnaire (see Appendix D). The questionnaire consisted of five 7-point rating scales on which the subject rated the importance of five distributive philosophies in allocating loans chosen as relevant to the allocation task from those suggested by Deutsch (1975). Then, the subject was asked to list up five of the 21 application items he or she thought were important for his or her allocation decisions in order of their importance. When the subject completed the pre-decision questionnaire, the experimenter started the loan task programme on the computer screen, asked the subject to begin, and left the room.

After the subject finished the allocation task, he or she was asked to complete a post-decision questionnaire (see Appendix E). This questionnaire asked for 7-point scale ratings of: (1) perceived scarcity of loans; (2) perceived size of applicant population; (3) confidence in the fairness of his or her own allocation; and (4) fairness of the procedures of his or her allocation. The subject was asked to list: (5) number of commission errors (i.e., applicants selected who should not have been); and (6) omission errors (i.e., applicants not selected who should have been³, and then to rate: (7) the fairness of distributive philosophies; and (8) the fairness of application items. Also, the subject was asked (9) if he or she

³In Condition 1, in which only one loan was available, wording of the question about commission error was changed into "Do you think that the applicant you accepted deserves the loan?"

wanted to have any other application items which were not available on the applications. The subject was asked to evaluate his or her information examination in terms of: (10) the percentage of information examined to total amount; (11) the sufficiency of information examination; (12) the sufficiency of time spent for information examination; and (13) the systematism of information examination. Finally, the post-decision questionnaire again included the identical questions about the importance of five distributive philosophies and important application items in allocating loans as those used in the pre-decision questionnaire.

The subject was then thanked for his or her participation, and the experimenter scheduled the second session within a few days based on a convenient time and date for the subject. The subject was given the written debriefing (see Appendix F). The information examination lasted about 30-50 minutes, and whole session about one hour.

5.2 Methods of Study 2

Subjects. Subjects were the same 72 Carleton University undergraduate male and female students who had participated in Study 1⁴. They received an additional one hour of experimental credit as requirement for their course by participating in Study 2.

Design. A 2 x 2 x 3 factorial design was employed for Study 2. Two of the independent variables were those used in Study 1; one was the degree of scarcity defined

⁴Another eighteen subjects participated in Study 2 as a pilot study. These subjects did not participate in Study 1. This pilot study was conducted in order to determine if there were any differences in the fairness judgements between observers who had experienced allocation decision task in Study 1 and those who had had no such experience. The Low scarcity / Small population condition was used for this pilot study. There were no significant differences in any of the fairness judgments between the observers with and without decision making experience.

by the ratio of loans to applicants (1 to 8 versus 1 to 4) and the other was the applicant population (8 versus 16 applicants).

In order to examine the effects of information about adjudicators' decision making on observers' judgment of fairness, the third independent variable was introduced in Study 2: kind of information observed. There were three levels in this variable (see Table 5.2). One of the levels comprised the Principles and Procedures condition, in which each observer was given information about both the principles and the procedures of adjudicator's allocation decisions. A second level comprised the Principles Only condition, in which observers were asked to evaluate allocation decisions based on information about adjudicative principles. The third level comprised the Procedures Only condition, in which the subjects were asked to evaluate allocation decisions based on information about procedures. In all conditions, complete application forms of all the applicants and the information about outcomes of the decisions (i.e., which applicants were accepted) were provided to the subjects.

Procedures. Subjects participated individually. Recall that in Study 1, 18 subjects were randomly assigned to each of the four conditions, resource scarcity (2) x applicant population (2). In Study 2, six subjects from each of these four conditions were randomly assigned to one of the three information conditions. The design of Study 2 is presented in Figure 5.2.

Allocation responses collected from subjects in Study 1 were used as the allocation stimuli which subjects evaluated in Study 2. In each of the twelve conditions of Study 2, the six subjects were paired randomly. Data collected from one of the paired subjects in Study 1 were used as the allocation decision stimuli which the other evaluated. Thus, in each of the twelve conditions, three pairs of subjects (A-B, C-D, and E-F) were formed; the subjects of each pair evaluated each other's first session allocation decisions.

Table 5.2. Three levels of the third independent variable in Study 2.

Conditions	Kind of Information Observed	
	Information of the adjudicator's allocation decisions about:	
Principles and Procedures	Principles + Procedures	+ Outcomes
Principles Only	Principles	+ Outcomes
Procedures Only	Procedures	+ Outcomes

Figure 5.2. Experimental design of Study 2.

In all conditions, subjects were told that this study concerned the evaluation of student loan decisions made by the other person, using the same task and applicants as he or she used in the first session. The subject was told that his or her task was to evaluate the allocation decision making of the other person based on the information about the allocation decisions.

In order to remind the subject about his or her own allocation decision making in Study 1, he or she was given his or her pre-decision questionnaire of Study 1 containing the original importance ratings of distributive philosophies and the listing of the important application items. Also, each subject was shown his or her final decisions and the record of his or her information examination (see, Appendix. G). The record included the exact trajectory of his or her information examination (i.e., in which order and which information he or she had examined and when making decisions). After the subject examined the information about his or her own allocation decision making, he or she was asked to evaluate the other's allocation decision making. The information about his or her own decisions was left with him or her for possible reference during the task.

In the Principles and Procedures condition, each of the paired subjects was shown the other person's pre-decision questionnaire of Study 1 about importance of distributive philosophies and the application items. In addition, the subject was shown the other person's final loan decisions and a set of application forms of the applicants. The subject was then told that he or she would be shown, on the computer screen, the trajectory of the other person's information examination and decisions of acceptance, rejection, and/or reconsideration. This trajectory provides information about the other person's procedures - how the decisions had been made. A computer program played back the trajectory of the other person's decision process which was recorded in the data file in Study 1 (see

Appendix H for the computer program). Each step of information examination by the other person was shown every time when the subject pressed the return key, so that the subject could control the pace to observe the trajectory. The experimenter demonstrated the program, using a sample information examination, for the subject to become familiar with how the other person's information examination would be replayed.

The subject was given an "Evaluation Sheet" to evaluate the other person's allocation. (see Appendix I). The subject was asked to evaluate: 1) overall fairness of the other person's allocation decision making; 2) fairness of the other person's principles (i.e., distributive philosophies and application items); 3) fairness of outcomes (i.e., commission and omission errors); 4) fairness of the procedures the other person employed. The subject was also asked to rate the sufficiency of information examined and the systematism of information examination, and to write down any comments concerning the other person's allocation.

The subject was asked to read the evaluation sheet to acknowledge on which aspects he or she should evaluate the other person's decision making. The subject was told that he or she could use any information given to him or her to evaluate the other person's allocation decision making after watching the trajectory. After answering questions, the experimenter started the "playback" on the computer screen, asked the subject to begin watching the other person's information examination, and left the room.

In the Principles Only condition, each subject was given the information about the other's importance ratings of distributive philosophies and listing of the important application items as well as the other person's decision outcomes and a set of application forms of the applicants, just as in the Principles and Procedures condition. However, the subject in the Principles Only condition, was not shown the trajectory of the other person's information examination. That is, the subject was asked to evaluate the allocation decisions

only based on information about principles and outcomes. In order to evaluate the other person's allocation decisions, the subject was given the evaluation sheet which was visually identical to the one used in the Principles and Procedures condition (see Appendix J). Differences in the evaluation sheet in this condition were found in the exclusion of questions related to procedures such as the fairness of procedures, the sufficiency and the systematism of information examination. In the Principles Only condition, each subject was asked to rate the fairness of the principles, the fairness of outcomes and the overall fairness of the other person's allocation.

Each subject was told that he or she could use any information given to him or her in evaluating the other person's allocation decision making. After answering questions, the experimenter asked the subject to begin evaluating the other person's allocation decisions and left the room.

In the Procedures Only condition, each subject evaluated allocation decision making by observing the trajectory and examining the outcomes of allocation decisions. The subject was told that he or she would be shown, on the computer screen, the recording of the other person's information examination, shown a demo of the trajectory, and given the evaluation sheet, which was similar to the one used in the Principles and Procedures condition (see Appendix K). The only difference was in the exclusion of questions related to principles.

The subject was told that he or she could use any information given to him or her in evaluating the other person's allocation decision making after watching the trajectory. After answering questions, the experimenter started the "playback" on the computer screen, asked the subject to begin watching the other person's information examination, and left the room.

In all conditions, as soon as a subject had completed the evaluation task, the

experimenter asked if he or she had any additional comments on the allocation decision making he or she evaluated. Then the experimenter thanked for his or her participation and explained the nature of the studies with the written debriefing (see Appendix L). The session of Study 2 lasted 40-60 minutes.

Chapter 6: Results of Study 1

Study 1 was conducted to examine how adjudicators make allocation decisions and how they judge the fairness of their own allocation decision making. Resource scarcity and applicant population were manipulated to determine the influences of these variables on the adjudicators' decision making processes as well as the fairness judgments of their own decision making. The results of Study 1 are presented in seven sections: 1) the importance of allocation principles for adjudicators before making decisions; 2) the adjudicators' decision making processes; 3) their perceptions of the allocation situation; 4) the importance of allocation principles for the adjudicators after making decisions; 5) the adjudicators' judgments of the fairness of their own allocation decisions; 6) the adjudicators' evaluations of their own decision processes; and 7) the relationships between adjudicators' fairness judgments and decision processes. The effects of applicant population, resource scarcity and gender of subjects are explored in each of these sections.

6.1 Adjudicators' allocation principles

In the pre-decision questionnaire, subjects were asked to indicate the importance of five different distributive philosophies and to list the five (of 21) most important application items for making allocation decisions. In order to examine how important the adjudicators considered different decision principles in loan allocation, their responses in the pre-decision questionnaire were analyzed.

Which distributive philosophies are important? After subjects were told about the situation in which they had to make allocation decisions, they were asked to rate the importance of five distributive philosophies in allocating loans to applicants: 1) needs, 2) abilities, 3) efforts, 4) accomplishments, and 5) personalities. All five philosophies were

rated on a 7-point scale, from -3 (Not important at all) to +3 (Very important). Figure 6.1 shows the mean ratings of the five distributive philosophies. On average, the applicants' needs were considered most important in making loan decisions, followed by the applicants' efforts and abilities. Applicants' accomplishments and personalities were not considered very important in loan decisions.

In order to determine if the importance of these philosophies varied according to the degree of resource scarcity, applicant population, and/or gender of subjects, the importance ratings of each of the five distributive philosophies were analyzed by a 2 (High vs. Low scarcity) $\times$ 2 (Small vs. Large population) $\times$ 2 (Male vs. Female subjects) ANOVA. Subjects about to judge 16 applicants considered that applicants' needs would be more important ($M = 2.6$) than those about to judge eight applicants ($M = 1.8$), $F(1, 64) = 9.75$, $p < .01$. Ability was considered more important when one in four applicants could receive loans ($M = 1.4$) than when one in eight could receive them ($M = 0.8$), $F(1, 64) = 8.50$, $p < .01$. Neither applicant population nor scarcity had a significant effect on average importance ratings of effort, accomplishment or personality. Males and females did not give significantly different ratings of any philosophy.

In order to examine how the subjects distinguished these five different philosophies, correlations among their ratings were calculated. Ratings of the ability principle and the accomplishment principle were positively correlated ($r = .36$, $t(43) = 2.49$, $p < .05$ for males and $r = .45$, $t(25) = 2.01$, $p < .05$ for females). The effort principle and the personality principle were also positively correlated ($r = .35$, $t(43) = 2.46$, $p < .05$ and $r = .53$, $t(43) = 3.12$, $p < .01$ for males and females, respectively). However, the need principle was not correlated with any other principles.

Figure 6.1. Relative importance of distributive philosophies: Pre-decision.

Which application items should be used? Before the decision task, subjects were asked to indicate which five of the 21 application items were most important, then to rank these five in order of their importance. Table 6.1a shows the ten most frequently listed items. "Living Expenses" was listed most often, followed by "Description of Need," and "Study Expenses," and "Parents' Contribution."

Two gender differences were found (see also Table 6.1a). Chi-square tests indicate that "Description of Need" was listed by a greater proportion of female subjects than male subjects, $\chi^2 (1, N = 72) = 3.81, p < .05$, while "GPA of Last Year" was listed by more males than females, $\chi^2 (1, N = 72) = 3.95, p < .05$. There were no significant gender differences in the other application items. Additional chi-square tests for application items indicate no significant differences in item frequency among the four experimental conditions.

The important application items listed by subjects were further analyzed by examining their ranks. Ranks were scored from 5 to 0: a subject's highest ranked application item was scored 5, second ranked was scored 4, etc. Items not in the top five were scored 0. Average rankings are presented in Table 6.1b. The average for "Description of Need" was highest, followed by those for "Parents' Contribution," "Living Expenses," and "Study Expenses" -- a pattern similar to their frequency of listing (see Table 6.1a). In order to examine if there were ranking differences attributable to gender or to the manipulated variables, the average ranks were analyzed by a 2 x 2 x 2 ANOVA for each of the top ten items. There were no significant gender differences in the average ranks, neither were there any influences of resource scarcity or applicant population.

Table 6.1a. Most important application items: Pre-decision.

Rank	Items	Percentage		
		Overall	Males ^a	Females ^b
1.	Living Expenses	61.1	57.8	66.7
2.	Description of Need	56.9	48.9	70.4 *
3.	Study Expenses	48.6	48.9	48.1
4.	Parents' Contribution	48.6	46.7	51.7
5.	Income from Summer Employment	37.5	35.6	40.7
6.	Total Net Income	33.3	37.8	25.9
7.	GPA of Last Year	30.6	37.8	18.5 *
8.	Self-evaluation of Seriousness	29.2	26.7	33.3
9.	Full/Part Time of Study	26.4	28.9	22.2
10.	Gross Salary per Week	25.0	26.7	22.2

Note: N=72. ^a n = 45. ^b n=27.

*p < .05 for gender differences.

Table 6.1b. Average rankings of most important application items: Pre-decision.

The sum of the scores / The number of subjects				
Rank	Items	Overall	Males ^a	Females ^b
1.	Description of Need	1.8	1.6	2.1
2.	Parents' Contribution	1.6	1.6	1.6
3.	Living Expenses	1.6	1.4	2.0
3.	Study Expenses	1.6	1.5	1.7
5.	Income from Summer Employment	1.3	1.3	1.3
5.	Total Net Income	1.3	1.4	1.1
7.	Self-evaluation of Seriousness	1.0	0.9	1.1
8.	GPA of Last Year	0.8	1.0	0.6
9.	Gross Salary per Week	0.7	0.8	0.6
10.	Full/Part Time of Study	0.6	0.7	0.4

Note: N=72. ^a n = 45. ^b n=27.

The "Description of Need" presumably reflects the need principle. Although more females than males considered this item important (Table 6.1a), there was no reliable gender difference in the importance of the need principle. "GPA of Last Year" may be considered to reflect the ability principle or the accomplishment principle. Although more males listed this item than females (Table 6.1a), there were no gender differences in the importance of these distributive philosophies. What kind of relationships did exist between distributive philosophies and application items? In order to determine these relationships, a Kendall rank-order correlation was computed between the importance rating of each distributive philosophy and the rank score given by subjects for each of the top ten items included in Table 6.1b. The statistically significant correlations are shown in Table 6.1c. They suggest that there may be various relationships between distributive philosophies and application items; one item might reflect more than one philosophy, as found in the significant relation between "GPA of Last Year" and both ability and accomplishment principles for females. Also, these philosophy-item relationships may vary across individuals, as indicated by the gender difference in the relation between distributive philosophies and items such as "GPA of Last Year."

6.2 Decision making processes of adjudicators

In order to determine how adjudicators make allocation decisions, sequences of information examination and decision making were analyzed (see Appendix G for an example of subjects' decision processes). Included were analyses of the amount of information examined and re-examined before making a decision, the heuristics employed in making decisions (e.g., sequences of examining information, frequency of changing decisions, etc.) and inter-judge consistency of decisions.

Table 6.1c. Kendall rank-order correlations between distributive philosophies and application items: Pre-decision.

Philosophies	Items	Overall	Males ^a	Females ^b
Need	& GPA of Last Year	-.20**	-.30**	.13
Ability	& GPA of Last Year	.26**	.22**	.38**
Effort	& Income from Summer Employment	.25**	.42**	.04
Accomplishment	& GPA of Last Year	.07	.01	.28*

Note: N=72. ^a n = 45. ^b n=27.

*p < .05. **p < .01.

How much information do adjudicators examine? In order to explore some of the characteristics of subjects' examination of applicant information, several indices were calculated. Many indices were derived from counting looks at pieces of information. The term piece refers to the information in the cell at the intersection of an applicant and an application item. For example, Applicant B's "Sex" is one piece of information ("male") and Applicant C's "Parents' Contribution" is another piece of information ("\$4,000"). One-hundred, sixty-eight pieces of information were available for the subjects in the Small population condition (8 applicants x 21 items); 336 pieces of information were available in the Large population condition (16 applicants x 21 items).

Recall that subjects were not obliged to examine all pieces of information. The proportion of ignored information provides some idea of how selective the subjects were in examining applicants. The ignored proportion is simply the number of pieces not examined divided by the number of pieces available. For example, suppose that a female subject in the Small population condition (168 pieces available) examined 118 pieces. She thus did not examine $168 - 118 = 50$ pieces of information at all. Her ignored proportion is thus $50 / 168 = 30\%$.

Recall as well that a subject could look at any piece of information as many times as he or she wished. Suppose the above subject who examined 118 pieces of information looked at 102 pieces once, 10 pieces twice, and six pieces three times. Her total looks would be $102 + (2 \times 10) + (3 \times 6) = 140$. Because she was required to examine eight applicants, her average looks per applicant would be $140 / 8 = 17.5$ pieces. Because she re-examined 10 pieces once and six pieces twice, her total re-looks would be $10 + (2 \times 6) = 22$ times and her re-look proportion would be $(140 - 118) / 140 = 22 / 140 = 16\%$. A subroutine in the computer programme which presented the stimuli also recorded the total

amount of time subjects spent in examining information. The average examination time for each applicant was calculated from this total.

The ignored proportion, total looks, average looks per applicant, re-look proportion, and average examination time were calculated from each subject then analyzed by 2 (High and Low scarcity) x 2 (Small and Large population) x 2 (Males and Females) ANOVAs. There were significant main effects of applicant population on all these indices. As indicated in Table 6.2a, compared to subjects considering 8 applicants, those considering double the number of applicants ignored more of the information available, examining less information per applicant, re-looking the information less often, and taking less time per applicant to make their decisions.

Although there was a strong influence of the applicant population on the amount of information examined, the scarcity of loans had no influence on it, except in a scarcity by gender interaction, $F(1, 64) = 6.52, p < .05$. Females re-looked at more information in the High scarcity condition ($M = 36.9\%$) than in the Low scarcity condition ($M = 23.6\%$), $F(1, 64) = 5.46, p < .025$, whereas there was no reliable difference in males' re-examination (37.4% and 41.3%, respectively).

In sum, the results suggest that adjudicators place an upper limit on the amount of time, effort or attention they will devote to their task, so that as the size of an adjudication increases, the amount of time or attention paid to any applicant declines. One might predict that increasing scarcity would motivate adjudicators to be more careful in their choices, examining and re-examining more available information. Yet there was no increase in information examined, and only females re-examined more information when scarcity increased.

Table 6.2a. The amount of information examined.

Measurement	Applicant Population ^a		F(1, 64)
	Small (168 pieces)	Large (336 pieces)	
Ignored Proportion	9.2%	23.3%	11.16 ^{**}
Total Looks	276	412	13.60 ^{**}
Average Looks per Applicant	35	26	7.63 ^{**}
Re-look Proportion	38.6%	33.0%	4.17 [*]
Average Examination Time	114 sec	70 sec	16.59 ^{**}

^a $n = 36$ in each condition.

* $p < .05$. ** $p < .01$.

In which order do adjudicators examine information? Two indices were employed to determine patterns of the sequence in which subjects examined applicants' information. First, a methodical index was calculated for each subject based on his or her looking patterns. From one look to the next, a subject could (1) look at the same piece twice, (2) look at another item concerning the same applicant, (3) look at another applicant on the same item, or (4) look at another applicant and item. Alternatives 2 and 3 represent methodical "applicant by applicant" (column by column) and "item by item" (row by row) searches. Alternatives 1 and 4 show sticking or hopping (e.g., A's Sex, A's Sex, C's Age, A's Sex, C's GPA, D's Age, G's Income) with no particular pattern.

The **methodical index** was defined as the relative number of methodical transitions to the total transitions. This index ranges from 0 to 1; the value closer to 1 reflects more systematic (methodical) examination. An ANOVA indicates that there was no significant difference in the methodical index among the 2 x 2 experimental conditions or between males and females. The grand mean of the methodical index was 0.96, indicating that subjects generally examined information in highly systematic ways.

In order to determine if adjudicators examine information item-by-item more or less frequently than applicant-by-applicant, an **information examination index** (Payne, 1976) was calculated for each subject. This index was defined by the relative number of the two methodical transitions noted above: item-by-item (e.g., C's GPA, D's GPA, E's GPA...), and applicant-by-applicant (e.g., C's Sex, C's Age, C's GPA...). The formula for this index, **H**, is

$$H = (A - I) / (A + I)$$

where: **A** = the number of consecutive looks at different application items
 of the same applicant;

I = the number of consecutive looks at different applicants on the same application item.

The index, H , ranges from -1.0 to +1.0; a negative value reflects more item-by-item examination and a positive reflects more applicant-by-applicant examination. The values of H were, in general, highly positive; 89% of the subjects' scores were higher than +0.5, indicating a strong tendency to examine information applicant-by-applicant rather than item-by-item. In particular, this tendency was stronger in females. A three-way ANOVA shows that females employed more alternative-by-alternative examination ($M(H) = +0.87$) than did males ($M(H) = +0.71$), $F(1, 64) = 4.42$, $p < .05$. However, neither resource scarcity nor applicant population reliably affected the sequence in examining information. Subjects tended to examine different information items of one applicant before continuing to another applicant. This result is not congruent with the findings in most decision making studies.

What information do adjudicators avoid? As reported earlier, many subjects did not look at all the available information but examined only part of it. One way to reduce the task demand in examining information is to focus on certain application items and to ignore others. Another is to focus on a few applicants and ignore the rest. Which of these did subjects most often employ?

Suppose that a subject decides to focus on three applicants A, B and D. By definition, he or she would look at more information about these three applicants than about others. This would be indicated by higher frequency of the examination in these three applicants, and thus by a skewed distribution of examination frequency. If no applicants are examined selectively, then the frequency of information examination will be about equal for each applicant. Alternatively, a subject could examine information selectively by focusing on certain information items. For example, if the subject decided to focus on

"Description of Need," "GPA of Last Year," and "Total Net Income" of the applicants, he or she would examine applicants on these three items more often than on other items. This would be indicated by higher frequency of the examination in these three items, and thus by a skewed distribution of examination frequency.

It is thus possible to analyze whether subjects limited themselves to certain applicants or items by calculating the concentration of the looks across applicants and across items. A Gini coefficient was employed for this analysis. The Gini coefficient is an index of the concentration of frequencies across different categories. The formula for the Gini coefficient is

$$\text{Gini} = \sum |f_i - T/C| / 2(T - T/C)$$

where T : the total frequency

C : the number of categories

f_i : frequency in category i

Gini = 0 indicates no concentration (i.e., frequencies of looks are equal in all categories) and 1 indicates the highest concentration (i.e., all looks fall in one category). Between 0 and 1, a higher value indicates higher concentration of frequencies in some categories and a lower value indicates higher dispersion across categories. An example is given in the Figure 6.2a. Suppose that there are twelve pieces of information about three applicants on four items. Two subjects, L and M, look at the six pieces of information ("X" in the figure). In the Examination Pattern of L, different applicants were examined more equally than in the Pattern of M. If the Gini is computed across applicants, the coefficients are 0.0 for the Pattern L but .50 for the Pattern M. That is, the higher Gini across applicants indicates that the M subject focused on certain applicants more. On the other hand, in terms of application items, L focused on certain items (I and II) more than M did. The Gini

Examination Pattern of L

Examination Pattern of M

		Applicants						Applicants					
		A	B	C	f			A	B	C	f		
Items	I	X	X	X	3	Items	I	X	X		2		
	II	X	X	X	3		II	X	X		2		
	III				0		III	X			1		
	IV				0		IV	X			1		
		f	2	2	2	6 = T			f	4	2	0	6 = T

"X" : The cell is examined.

$$\text{Gini} = \frac{|f_i - T/C|}{2(T - T/C)}$$

T : Total Frequency

C : Number of Categories

f_i : Frequency in Each Category

Gini across 3 applicants

$$\text{Gini} = \frac{|2-2|+|2-2|+|2-2|}{2(6-2)}$$

$$= 0.0$$

$$\text{Gini} = \frac{|4-2|+|2-2|+|0-2|}{2(6-2)}$$

$$= .50$$

Gini across 4 items

$$\text{Gini} = \frac{|3-1.5|+|3-1.5|+|0-1.5|+|0-1.5|}{2(6-1.5)}$$

$$= .67$$

$$\text{Gini} = \frac{|2-1.5|+|2-1.5|+|1-1.5|+|1-1.5|}{2(6-1.5)}$$

$$= .22$$

Figure 6.2a. An example of examination patterns and Gini coefficients.

coefficients across items for the patterns of L and M are .67 and .22, respectively. That is, the higher Gini across items indicates that the subject examined information focusing on certain items more.

A Gini coefficient was first calculated for each subject's information examination across eight or sixteen applicants, and analyzed by an ANOVA. Subjects looked at applicants more selectively when loans were scarce ($\bar{M}(\text{Gini}) = .20$) than when loans were relatively plentiful ($\bar{M}(\text{Gini}) = .16$), $F(1, 64) = 5.98$, $p < .05$. Neither gender of subjects nor the applicant population reliably affected concentration on selected applicants.

The Gini coefficient was then computed across twenty-one items. Subjects examined applicant information more selectively in the Large population condition ($\bar{M}(\text{Gini}) = .22$) than in the Small population condition ($\bar{M}(\text{Gini}) = .15$), $F(1, 64) = 4.43$, $p < .05$. Neither resource scarcity nor the gender of subjects had a significant effect on the Gini across items. In sum, when the resource was relatively scarce, subjects' examination patterns were more like the pattern of "M" in Figure 6.2a, although each applicant was examined at least once in all conditions. When there were more applicants, their examination was more like the Pattern L, although the difference was small.

What were the information items most often examined? The proportion of looks of each item to total looks was computed for each subject. The mean proportions of the top ten items are presented in Table 6.2b. Overall, subjects examined "Description of Need" most often, and also frequently examined "Parents' Contribution," "Living Expenses," and "Income From Summer Employment." Although both male and female subjects also examined "Investments" and "Total Net Income" frequently, ANOVAs indicate that females examined these two items less often than did males, $F(1, 64) = 4.80$, $p < .05$ and $F(1, 64) = 4.73$, $p < .05$, respectively. Females examined applicants' sex more often ($\bar{M} = 4.0\%$)

Table 6.2b. The percentage of total looks at different items.

Rank	Items	Percentage		
		Overall	Males ^a	Females ^b
1.	Description of Need	8.1	7.8	8.6
2.	Parents' Contribution	6.2	6.3	6.0
3.	Total Net Income	6.0	6.5	5.2 *
4.5.	Living Expenses	5.9	6.4	5.2
4.5.	Income from Summer Employment	5.9	6.1	5.5
6.	Investments	5.7	6.5	5.0 *
7.	Study Expenses	5.6	5.8	5.2
8.	Income While Studying	5.5	5.4	5.5
9.	Gross Salary per Week	4.8	4.9	4.6
10.5.	GPA of Last Year	4.5	4.4	4.7
10.5.	Latest Employment	4.5	4.4	4.5

Note: N=72. ^a n = 45. ^b n=27.

* $p < .05$ for gender differences.

than did males ($M = 3.0\%$), $F(1, 64) = 5.59, p < .05$. Furthermore, ANOVAs indicate that applicants' "Birthdate" and "GPA in High School" were examined more often in the Small population condition ($M = 3.9\%$ and 4.5%) than in the Large population condition ($M = 2.9\%$ and 3.9%), $F(1, 64) = 4.13, p < .05$ and $F(1, 64) = 5.59, p < .05$, respectively. This indicates that subjects examined these items only when smaller number of applicants had to be examined and thus the demand of decision task was lower.

Did subjects focus on the application items that reflected their decision principles? The application items examined were compared with those listed as important items in the pre-decision questionnaire. I hypothesized that the number of looks would be largest for the first-listed item, second-largest for the second-listed item,and smallest for the non-listed items. This hypothesis was tested by Ordinal Pattern Analysis (Thorngate, 1987). The Index of Fit (IOF) in this analysis is the indicator of the degree of the fit of the prediction to the data. The IOF ranges from -1.0 to +1.0, and the IOF closer to +1.0 indicates a better fit of the prediction to the data. The IOF was calculated for each subject and analyzed by an ANOVA. There was no significant difference in the IOF among conditions or between male and female subjects. The mean IOF was +0.26, indicating a moderate fit of the hypothesis to the data. The mean proportions of the examination were 6.0% (first-listed items), 6.0% (second), 5.1% (third), 4.7% (fourth), 5.5% (fifth), and 4.6% (non-listed). That is, subjects examined the items selectively, but they did not necessarily focus on the items they had indicated as important ones before making decisions.

How often do adjudicators make decisions? Recall that subjects had three alternative actions for each applicant: accept, reject, or (re)consider. Because the decision task ended when a subject allocated his or her quota of loans, some applicants could be left "under

consideration" when the task had been completed. In such a decision situation, the frequency of rejecting and accepting applicants can reflect two different heuristics. One heuristic is to make many rejections of applicants who are considered unsatisfactory on certain items and finally accepting the remaining applicant(s). The other heuristic is, without rejecting, accepting applicants who are found to be satisfactory on certain items and cancelling the acceptances if better applicants are found. The former heuristic would result in relatively many rejections and fewer acceptances, whereas the latter would result in the less rejections and more acceptances. The former heuristic is expected to be useful in the case of the large applicant population because it simplifies the decision task by eliminating applicants.

In order to examine which heuristic was more often used by subjects, how many times a subject accepted applicants was analyzed. Because the number of available loans varied among the four conditions, the ratio of the number of acceptances to the number of available loans was calculated for each subject. The overall mean of the proportion was 1.8, indicating that subjects accepted 80% more applicants than they had loans to give. Although marginally significant, $F(1, 64) = 3.50$, $p = .06$, subjects seemed to accept applicants more often when loans were scarce and applicant population was relatively small as indicated in Figure 6.2b. There was no significant gender difference in the proportion of acceptances.

Rejections were next examined. Because the number of applicants and the number of available loans varied among the four conditions, the proportion of rejections to the applicants who could be rejected (i.e., the number of applicants minus the number of loans available) was calculated for each subject, and analyzed by an ANOVA. There was no reliable difference in the proportion of rejections among the four conditions nor between males and females. In general, subjects eliminated applicants often ($M = .82$), but kept, on

Figure 6.2b. Frequency of accepting applicants.

average, 25% of the applicants under consideration without rejecting nor accepting. In sum, application population and resource scarcity had only slight influences on the frequency of making decisions. Neither gender of adjudicators had influence on it.

How often do adjudicators change their mind? Recall that subjects could change their decisions as often as they wished. An analysis was conducted to examine how often subjects cancelled their acceptances and rejections. There was a significant interaction of resource scarcity x applicant population on the amount of cancellation of acceptance, $F(1, 64) = 4.69, p < .05$. As seen in Figure 6.2c, only when a highly scarce resource was to be allocated for relatively small number of applicants, subjects cancelled acceptances often, $F(1, 64) = 5.20, p < .025$. There was no significant difference in the cancellation of rejections among the four conditions, nor was there a reliable gender difference; on average, 16.0% of the rejections were cancelled during decision making processes. Rejections of applicants were cancelled about half as often as acceptances (22.8% to 41.9%), suggesting that applicants are less likely to be re-considered once they have been rejected and the acceptance of applicants may be cancelled more frequently than the rejections

How consistent are the decision outcomes across adjudicators? Inter-judge consistency in the decision outcomes was examined; to what degree did the subjects accept the same applicants? Because no characteristic differences were observed in the decision outcomes made by males and by females (see Table 6.2c)¹, an analysis was conducted

¹It would be interesting to examine whether subjects tended to accept applicants of their same gender and whether male applicants were generally accepted more or less often than female applicants. However, two male applicants (D and G) were accepted by only a few subjects, and thus these analyses could not be conducted.

Figure 6.2c. Frequency of cancelling acceptance.

Table 6.2c. The number of subjects who accepted each applicant.

Condition	Applicants															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Scarcity /Applicant population																
High / Small (1 loan / 8 app.)																
Male (n=12)	2	-	4	1	-	-	-	-	5							
Female (n=6)	2	-	-	-	1	-	-	-	3							
Total (n=18)	4	-	4	1	1	-	-	-	8							
Low / Small (2 loans / 8 app.)																
Male (n=11)	5	1	7	-	5	1	-	3								
Female (n=7)	3	-	4	2	2	-	-	3								
Total (n=18)	8	1	11	2	7	1	-	6								
High / Large (2 loans / 16 app.)																
Male (n=11)	2	-	3	-	-	-	-	1	-	-	1	-	4	7	2	2
Female (n=7)	-	1	1	-	-	-	-	2	-	-	1	-	4	3	2	-
Total (n=18)	2	1	4	-	-	-	-	3	-	-	2	-	8	10	4	2
Low / Large (4 loans / 16 app.)																
Male (n=12)	1	3	4	3	2	-	-	4	3	-	4	2	8	7	4	3
Female (n=6)	2	1	4	-	-	-	-	3	3	-	-	-	5	2	2	2
Total (n=18)	3	4	8	3	2	-	-	7	6	-	4	2	13	9	6	5

Note: "-" refers to zero.

based on the data pooled over subjects' gender. An index of inter-judge consistency was computed in each of the four experimental conditions.²

When a pair of subjects accepted a particular applicant in common, the decision outcome is defined as being consistent within the pair. The consistency index is based on how many pairs of subjects accepted the same applicants. See Figure 6.2d for an example to calculate the consistency index. Suppose that ten subjects were asked to select two out of eight applicants. The inter-judge consistency of the decision outcomes would be highest when all of the ten subjects accepted the particular two applicants, say B and D (see the right pattern in Figure 6.2d). ${}_{10}C_2 = 45$ pairs can be made from the ten subjects (1&2, 1&3, 1&4... 8&9 and 9&10). Each of these possible pairs accepted Applicant B in common, and thus 45 pairs of decision outcomes are consistent. These 45 pairs also accepted Applicant D in common. Therefore, in total, $45+45 = 90$ pairs of acceptances are consistent, and this is the maximum in this particular allocation situation (i.e., choosing two out of eight applicants). On the other hand, the inter-judge consistency of the decision outcomes would be lowest when each applicant was accepted with equal frequency, as seen in the left pattern in Figure 6.2d. Because Applicant A was accepted by three subjects (1, 8 and 10), the decisions within each of the three pairs (1&8, 1&10 and 8&10) are consistent. As well, three pairs of decisions are consistent in the acceptance of each applicant, B, C, and D. Applicant E was accepted by two subjects, and thus there is one pair of consistent decisions (${}_2C_2 = 1$). The same calculation can be done for each of the applicants, F, G, and H. Therefore, in total, there are $3+3+3+3+1+1+1+1 = 16$ pairs of

²This analysis reveals low inter-judge consistency in decision outcomes across the four experimental conditions. Readers can skip the next two paragraphs in which the calculation of the index was explained, unless readers are particularly interested in the index.

Figure 6.2d. An example of decision outcomes and the index of inter-judge consistency.

consistent decision outcomes in this pattern, and this is the minimum in this particular allocation situation.

Any outcome pattern falls between these two extreme cases. In the pattern from the example data (one in the center in Figure 6.2d), Applicant D was accepted by seven subjects, and thus the outcomes of the 21 pairs (7C_2) are consistent. Applicant B was accepted by six subjects, there being ${}^6C_2 = 15$ pairs of consistent outcomes. Each of the applicants, A and G, was accepted by one pair of subjects. Therefore, in total, $21+15+1+1 = 38$ pairs are consistent decisions. The index of inter-judge consistency of a given outcome pattern was defined as its relative number of pairs of consistent decisions to those in the two extreme patterns with lowest and highest inter-judge consistency. The index, $\underline{C}$, ranges from 0 to 1, and a value closer to 1 indicates higher inter-judge consistency. The formula for this index, $\underline{C}$, is

$$\underline{C} = (P_D - P_{\min}) / (P_{\max} - P_{\min})$$

where: P_D = the number of pairs of consistent decisions in the data

$P_{\min}$ = the minimum number of pairs of consistent decisions

$P_{\max}$ = the maximum number of pairs of consistent decisions

The number of pairs of consistent decisions in each pattern, P_k , is

$$P_k = \sum n_i C_2$$

where: n_i = the number of subjects who accepted Applicant i

The values of $\underline{C}$ are, in general, low; .20, .23, .24 and .20 in the High/Small, the Low/Small, the High/Large, and the Low/Large conditions, respectively. That is, there was only low consistency among subjects' decision outcomes regardless of resource scarcity and applicant population.

2

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6.3 Adjudicators' perception of allocation situations

In the post-decision questionnaire, subjects were asked to rate how scarce the loans were relative to the number of deserving applicants on 7-point scale (from -3 for "Not enough at all" to +3 for "More than enough") as well as how large the applicant population was (from -3 for "Too small" to +3 for "Too large"). A three-way ANOVA indicates that there was no difference in the rating of the degree of scarcity among the four conditions nor between males and females. On average, subjects perceived that the loans were less than enough ($M = -1.0$) because the number of applicants exceeded the amount of resource, but they did not differentiate the degree of scarcity. Subjects who examined 16 applicants considered indeed that the applicant population was larger ($M = 0.8$) than those who examined 8 applicants ($M = -0.2$), $F(1, 64) = 7.09$, $p < .01$. Subjects in the High scarcity condition considered that they had more applicants to examine ($M = 0.1$) than those in the Low scarcity condition ($M = -0.3$), $F(1, 64) = 4.31$, $p < .05$, although the difference was very small. Subjects seemed more sensitive to the applicant population than to the degree of scarcity, and this tendency seems consistent with the effects of these two variables on the amount of information examined; the amount of information adjudicators examined was largely affected by the applicant population.

6.4 Adjudicators' allocation principles after decision making

After making allocation decisions, subjects were again asked to indicate the decision principles they considered important. Their responses in the post-decision questionnaire were analyzed in order to determine whether the importance of the five distributive philosophies and application items changed after the decision task. In addition, subjects' answers to the question, "Is there any other information about applicants that you wanted to see but was not available? (Question 9)" were analyzed in order to assess types of items

which subjects considered necessary for loan decisions.

Does making decision change the importance of the distributive philosophies? Figure 6.4a indicates the mean importance of the five different distributive philosophies rated by subjects before and after the decision task. After making decisions, on average, subjects still considered the need principle most important, followed by the effort principle. The post-decision rating of the importance of each distributive philosophy was moderately correlated with its pre-decision rating (see Table 6.4a).

The importance of each philosophy was analyzed by a four-way ANOVA, with a repeated measure of pre- vs. post-decision ratings in addition to the three between-subject variables (i.e., resource scarcity, applicant population, and subjects' gender). In the importance rating of the need principle, there was a three-way interaction of applicant population x gender x pre-post decision ratings, $F(1, 64) = 4.65, p < .05$. As indicated in Figure 6.4b, applicants' needs became more important after completing the decision only for females in the Small population condition, $F(1, 13) = 8.01, p < .025$. For males, the need principle generally became less important after making decisions ($M = 2.3$ and $M = 2.0$ before and after making decisions, respectively), $F(1, 44) = 5.65, p < .025$.

There were two-way interactions of resource scarcity x pre-post decision in the ratings of ability principle and effort principle, $F(1, 64) = 13.08, p < .01$ and $F(1, 64) = 8.38, p < .01$, respectively (see Figure 6.4c). In the Low scarcity condition, applicants' abilities and efforts became less important after making decisions, $F(1, 35) = 20.07, p < .01$ and $F(1, 35) = 16.58, p < .01$, respectively. There was no reliable change in the importance of the accomplishment principle or the personality principle after making decisions.

Figure 6.4a. Relative importance of distributive philosophies: Pre- and post-decision.

Table 6.4a. Pearson correlations between pre- and post-decision ratings of importance of distributive philosophies.

Philosophies	Correlation Coefficient	t (70)
Need	.43	3.96*
Ability	.52	5.10*
Effort	.65	6.50*
Accomplishment	.52	5.15*
Personality	.57	5.76*

* $p < .01$.

Figure 6.4b. Change of the importance of need principle.

Figure 6.4c. Change of the importance of ability principle and effort principle.

Recall that the importance of the principles of need, ability, and effort seemed to be independent before making decisions. As presented in the Table 6.4b., the need principle was still not significantly related with any other principle. However, the other four philosophies were positively related.

In sum, after completing the decision task, the principles of need and effort were still considered important. However, no philosophy became more important and different philosophies came to be positively correlated.

Does making decision change the importance of the application items? The important items listed in the post-decision questionnaire were analyzed in order to determine whether their importance changed after completing the allocation decision task. Table 6.4c shows the top ten items listed by the subjects. After completing the decision task, many subjects listed items such as "Description of Need," "Parents' Contribution" and "Living Expenses," which were also considered important before making decisions. However, the McNemar change test (Siegel & Castellan, 1988) indicated that "Living Expenses" was listed by less subjects after making decisions, $\chi^2 (1, N = 72) = 4.50, p < .05$, but that more subjects came to list "Description of Need" as an important item, $\chi^2 (1, N = 72) = 8.42, p < .01$ as well as "Investments" and "Income While Studying," $\chi^2 (1, N = 72) = 18.38, p < .01$ and $\chi^2 (1, N = 72) = 5.88, p < .05$, respectively. These increases were mainly due to changes in listing by males ($\chi^2 (1, N = 45) = 7.69, p < .01$, $\chi^2 (1, N = 45) = 14.06, p < .01$, and $\chi^2 (1, N = 45) = 4.17, p < .05$ for "Description of Need," "Investments," and "Income While Studying," respectively); there were no significant changes in the items listed by female subjects. There was no significant gender difference in the frequency of the post-decision listing of any of the items.

Table 6.4b. Pearson correlations among five distributive philosophies: Post-decision.

Philosophy	Need	Ability	Effort	Accomplishment	Personality
Need	-	.09	.11	-.08	-.04
Ability	.27	-	.51**	.55**	.34*
Effort	.06	.59**	-	.56**	.30*
Accomplishment	-.21	.40*	.24	-	.51**
Personality	.12	.45**	.30	.40*	-

Note : $n = 45$ for males and $n = 27$ for females. The values above the diagonal are for males and those below the diagonal are for females.

* $p < .05$. ** $p < .01$.

Table 6.4c. Most important application items: Post-decision.

Rank	Items	Percentage		
		Overall	Males ^a	Females ^b
		Post (Pre)	Post (Pre)	Post (Pre)
1.	Description of Need	75.0 (56.9)**	73.3 (48.9) *	77.8 (66.7)
2.	Parents' Contribution	56.9 (48.6)	55.5 (46.7)	59.9 (51.7)
3.	Living Expenses	47.2 (61.1)*	44.4 (57.8)	44.4 (66.7)
4.	Study Expenses	44.4 (48.6)	44.4 (48.9)	44.4 (48.1)
5.	Total Net Income	43.1 (33.3)	44.4 (37.8)	40.7 (25.9)
5.	Income: Summer Employment	43.1 (37.5)	37.8 (35.6)	51.9 (40.7)
7.	Investments	38.9 (8.3)**	44.4 (8.9)**	29.6 (7.4)
8.	GPA of Last Year	31.9 (30.6)	35.6 (37.8)	25.9 (18.5)
9.	Income While Studying	26.4 (11.1)*	20.0 (6.7) *	37.0 (18.5)
10.	Gross Salary per Week	21.0 (25.0)	15.6 (26.7)	29.6 (22.2)

Note: N=72. ^a n = 45. ^b n=27.

* p < .05, ** p < .01 for changes from pre- to post-decision.

The important application items listed by subjects were further analyzed by examining their ranks, as conducted for the pre-decision listing (see Table 6.4d). The scores for "Description of Need" and "Parents' contribution" were the two highest. ANOVAs indicate that there were differences between pre- and post-decision ratings on three items. The scores for "Description of Need" and "Investments" increased after completing the decision task, $F(1, 64) = 17.94, p < .01$ and $F(1, 64) = 18.05, p < .01$, respectively. However, the score for "Study Expenses" decreased, $F(1, 64) = 4.64, p < .05$. An ANOVA also indicates that the score for "Living Expenses" decreased in the females' ranking, $F(1, 64) = 8.95, p < .01$. These results seem consistent with those of the frequency of listing.

Concerning differences among the conditions, the McNemar change test indicates that, in the High scarcity / Large population condition, more subjects listed "Description of Need" after completing the decision task than before, $\chi^2(1, N = 18) = 3.90, p < .05$. Also, "Investments" was listed by more subjects after the decision task, $\chi^2(1, N = 18) = 4.17, p < .05$ in the all conditions except in the Low scarcity / Large population condition. There were no differences in the scores of other items among the four conditions.

In order to examine whether the relationships between distributive philosophies and application items changed after making decisions, a Kendall rank-order correlation was computed between the importance rating of each distributive philosophy and the rank given for each of the top ten items (see Table 6.4e). There were a few gender differences in these relationships. The result suggests that a certain item could be considered reflecting different philosophies across individuals; for example, "GPA of Last Year" was correlated with the ability principle for males, but with the accomplishment principle for females. Also, a certain philosophies could be considered to be reflected by different application

Table 6.4d. Average rankings of most important application items: Post-decision.

Rank	Items	The sum of the scores / The number of subjects		
		Overall	Males ^a	Females ^b
		Post (Pre)	Post (Pre)	Post (Pre)
1.	Description of Need	2.9 (1.8) **	2.8 (1.6)	3.1 (2.1)
2.	Parents' Contribution	1.9 (1.6)	1.7 (1.6)	2.2 (1.6)
3.	Total Net Income	1.5 (1.3)	1.6 (1.4)	1.4 (1.1)
4.	Income from Summer Employment	1.5 (1.3)	1.3 (1.3)	1.7 (1.3)
5.	Study Expenses	1.2 (1.6) *	1.3 (1.5)	0.9 (1.7)
6.	Living Expenses	1.1 (1.6)	1.2 (1.4)	0.9 (2.0) **
7.	Investments	1.0 (0.2) **	1.1 (0.2)	0.8 (0.2)
8.	GPA of Last Year	0.8 (0.7)	0.9 (1.0)	0.6 (0.6)
9.	Income While Studying	0.8 (0.4)	0.5 (0.2)	1.1 (0.7)
10.	Gross Salary per Week	0.5 (0.7)	0.3 (0.8)	0.7 (0.6)

Note: N=72. ^a n = 45. ^b n=27.

* p < .05, ** p < .01 for changes from pre- to post-decision.

Table 6.4e. Kendall rank-order correlations between distributive philosophies and application items: Post-decision.

Philosophies	Items	Overall Post (Pre)	Males ^a Post (Pre)	Females ^b Post (Pre)
Need	& Description of Need	.30**	.12	.56**
	& Investments	-.10	-.25*	.22
Ability	& GPA of Last Year	.29**(.26**)	.44**(.22**)	.03 (.38**)
	& Income While Studying	-.21**	-.24*	-.17
	& Parents' Contribution	-.26**	-.27**	-.25
Effort	& Income: Summer Employment	.10 (.25**)	.21* (.42**)	.07 (.04)
	& Gross Salary	.12	-.04	.31*
Accomplishment	& GPA of Last Year	.20* (.07)	.16 (.01)	.31*(.28*)

Note: N=72. ^a n = 45. ^b n=27.

*p < .05. **p < .01.

items; effort principle was correlated with "Income from Summer Employment," for males, but with "Gross Salary" for females. These gender differences in the philosophy-item relationships seemed to increase after making decisions.

After completing loan decisions, subjects were asked to list application items which were not available but they wished to have. Their listings were grouped into several categories (see Table 6.4f). The information related to applicants' family was listed by subjects most frequently, such as the number of children applicants have to support and their parents' income. The subjects stated that, if family could support applicants, these applicants should lose priority for loans and others who cannot have any support from their family should have priority. The other type of information was related to descriptions of applicants' living, such as detailed lists of living expenses, and expensive products applicants have bought recently.

In sum, after experiencing the decision making task, the subjects considered expenses estimated by applicants, need descriptions, family's support such as parents' contribution as the most important items to be used in making loan allocation. Among these items, particularly need descriptions became more important. In general, the important items for loan decision making became convergent among subjects after they completed the allocation decision. Again, the result suggests that a certain philosophy is not simply reflected by a certain item, and vice versa.

Table 6.4f. Items listed as additional information.

Category	# Subjects (Percentage)	
Parents/Spouse (income, living with them, etc)	27	(44.3%)
Description of Living (list of expenses, etc)	10	(16.4%)
School Work (year in program, course loads)	6	(9.8%)
Credit History	6	(9.8%)
Part-time Job (reason of no-job)	4	(6.6%)
Applicants' Assets	4	(6.6%)
Availability of Other Source	2	(3.3%)
Others	2	(3.3%)

Note: n=61 in Total.

6.5 Adjudicators' fairness judgments

Several analyses were conducted in order to examine how adjudicators judge the fairness of their own allocation decision making. After completing the decision task, the subjects were asked to rate their own allocation decision making in terms of overall fairness and the fairness of their decision principles, procedures and outcomes. The effects of resource scarcity, applicant population and gender on these fairness judgements were analyzed by three-way ANOVAs. Analyses were also conducted to determine the relationships of the fairness of decision principles, procedures and outcomes with overall fairness.

Do adjudicators believe that they made fair decisions? Subjects were asked to rate overall fairness, fairness of principles (i.e., distributive philosophies and application items), and fairness of procedures in the post-decision questionnaire on 7-point scale, from -3 (Very unfair) to +3 (Very fair). Subjects generally judged their own decisions quite fair overall ($M = 1.4$). Particularly, they judged that their distributive philosophies ($M = 1.7$) and procedures ($M = 1.8$) were quite fair, and their application items were moderately fair ($M = 1.0$). The ANOVAs indicate that there were no differences in any of the fairness ratings among the four conditions. Neither were there gender differences.

Subjects were also asked to list applicants who were not deserving but accepted (i.e., commission errors) and applicants who were deserving but not accepted (i.e., omission errors) if there were any such applicants in their decisions. Except one male subject in the Low scarcity / Large population condition who reported one commission error, all the subjects considered that they had accepted only deserving applicants. On the other hand, many subjects reported omissions of deserving applicants. On average, subjects considered 13.2% of the applicants were not accepted but deserving for loans. An

ANOVA indicates that there was no significant difference among the four conditions, nor was there gender difference. Although subjects reported omission errors, short interviews after the decision making task suggest that they attributed their omissions of deserving applicants to the resource scarcity; they wished to accept these applicants but they could not.

What is important in overall fairness judgment: principles, procedures or outcomes?

In order to determine which aspects of allocation decision (i.e., principles, procedures and outcomes) are important for its overall fairness, the relationships among these ratings were first determined using multiple regression analysis. Four variables³ were entered in the equation as predictors of the overall fairness rating: the amount of omission errors and the fairness ratings of philosophies, application items, and procedures

The regression equation was calculated separately for males and females. The significant proportion of the variance in their rating of overall fairness was significantly accounted for by these four predictors, $R^2 = .40$, $F(4, 40) = 5.77$, $p < .001$ for males and $R^2 = .59$, $F(4, 22) = 5.32$, $p < .001$ for females. The analyses indicate that the fairness rating of distributive philosophies was the only significant predictor of the overall fairness rating for males, $t(40) = 2.42$, $p < .05$, whereas the rating of procedural fairness was found to be the only significant predictor for females, $t(22) = 3.14$, $p < .01$.

The significance of a certain predictor in the multiple regression analysis indicates that this predictor can uniquely account for the significant proportion of the variance in the overall fairness which cannot be explained by any other variables in the equation. The other variables may also contribute in predicting the overall fairness, but may not be statistically significant if they are highly correlated with the first predictor. To determine

³The amount of commission errors was excluded from this analysis because all the subjects, except one male, reported no commission error.

the relationships among fairness judgments, a Pearson correlation was calculated for each pair of the five judgments. As indicated in Table 6.5a, for males and females, both of the fairness judgments of distributive philosophies and procedures are related to the overall fairness. The two judgments of distributive philosophies and procedures were highly correlated, and this high inter-correlation was the reason why only one of them was statistically significant in the regression analysis. Interestingly, no reliable relationship was found between the fairness ratings of philosophies and application items, suggesting that fairness of principles may be judged independently at abstract and concrete levels. Also, the proportion of omission errors was not significantly correlated with any other fairness ratings, suggesting that subjects did not consider the omissions of deserving applicants as decision errors which reduced the fairness of their decision making, perhaps because subjects attributed these omissions to the resource scarcity.

The relationships among five fairness judgments were examined in each of the four experimental conditions. Because there were only eighteen subjects in each condition, multiple regressions with four predictors are unlikely to be meaningful. Therefore, only simple correlations among variables were computed in order to assess the relationships among fairness judgments. The Kendall rank-order correlation was employed for this analysis because it is a powerful statistic to examine correlations with small sample size.

As presented in the Table 6.5b and 6.5c, in all conditions, the fairness of philosophies and procedures were related and both were related with overall fairness. The proportion of omission errors was not significantly correlated with any of the fairness ratings in all conditions. Also, the fairness of application items was not related to the fairness of distributive philosophies in any of the four conditions, suggesting the independence of the fairness of abstract and concrete decision principles.

Table 6.5a. Pearson correlations among the fairness judgments in males and females.

Variables	Overall Fairness	Fairness of Philosophies	Fairness of Items	Fairness of Procedures	Omission Errors
Overall Fairness	-	.57**	-.17	.54**	.11
Fairness of Philosophies	.63*	-	-.04	.60**	.13
Fairness of Items	.08	.19	-	-.20	-.06
Fairness of Procedures	.66**	.50*	-.08	-	-.09
Omission Errors	-.15	-.08	-.00	.07	-

Note : $n = 45$ for males and $n = 27$ for females. The values above the diagonal are for males and those below the diagonal are for females.

* $p < .01$. ** $p < .001$.

Table 6.5b. Kendall rank-order correlations among the fairness judgments in the Small population conditions.

Variables	Overall Fairness	Fairness of Philosophies	Fairness of Items	Fairness of Procedures	Omission Errors
Overall Fairness	-	.66**	-.03	.68**	-.23
Fairness of Philosophies	.50*	-	.18	.65**	.01
Fairness of Items	-.05	-.22	-	.07	-.15
Fairness of Procedures	.43*	.37*	-.42*	-	-.13
Omission Errors	.17	.11	.28	.04	-

Note : $n = 18$ for each condition. The values above the diagonal are for High scarcity condition and those below the diagonal are for Low scarcity condition.

* $p < .05$. ** $p < .01$.

Table 6.5c. Kendall rank-order correlations among the fairness judgments in the Large population conditions.

Variables	Overall Fairness	Fairness of Philosophies	Fairness of Items	Fairness of Procedures	Omission Errors
Overall Fairness	-	.39*	-.11	.37*	.15
Fairness of Philosophies	.41*	-	-.06	.65**	-.05
Fairness of Items	-.04	.13	-	-.37*	.04
Fairness of Procedures	.59**	.44*	-.14	-	-.03
Omission Errors	.05	.11	-.18	.13	-

Note : $n = 18$ for each condition. The values above the diagonal are for High scarcity condition and those below the diagonal are for Low scarcity condition.

* $p < .05$. ** $p < .01$.

6.6 Adjudicators' evaluations of their decision processes

After completing their task, subjects were asked to evaluate how sufficiently and systematically they looked at the applicants' information. First, the effects of the two manipulations and subjects' gender on these self-evaluations were analyzed by $2 \times 2 \times 2$ ANOVAs. Analyses were also conducted to determine the relationships of the procedural fairness and these self-evaluations of decision making.

How do adjudicators evaluate their own allocation decision making? Subjects were asked to rate the sufficiency of the amount of information examined, the sufficiency of the time spent for decision making, and the systematism of examining information on 7-point scale. Subjects were asked to rate on a scale from -3 to +3 how sufficient and systematic they believed their information examination to be. Subjects believed that they examined information more than enough ($M = +1.3$) and spent enough time in making decisions ($M = 0.5$). Recall that the subjects examined less information and spent less time to examine each applicant when there were more applicants to be examined. However, ANOVAs indicate that there were no differences in ratings of information and time sufficiency among the four conditions or between males and females. These results suggest that they considered that their examination was sufficient regardless of how much information they examined and how much time they spent in making decisions.

There was a significant interaction of resource scarcity $\times$ gender in subjects' ratings of their systematism, $F(1, 64) = 6.77, p < .05$. In the High scarcity condition, males considered their information examination more systematic ($M = 2.2$) than did females ($M = 1.3$), $F(1, 64) = 6.14, p < .025$. In Low scarcity condition, males' rating ($M = 1.3$) and females' rating ($M = 1.9$) were not significantly different. Second, the interaction of applicant population $\times$ gender was also statistically significant, $F(1, 64) = 5.18, p < .05$. In

the Small population condition, males considered that their information examination was more systematic ($M = 2.0$) than did females ($M = 1.2$), $F(1, 64) = 5.21, p < .025$. In the Large population condition, there was no reliable gender difference in the rating of systematism ($M = 2.0$ and $M = 1.7$ for males and females, respectively). In sum, when the resource scarcity was high or when there were relatively small number of applicants, males considered that their information examination was more systematic than did females. Recall that, in the subjects' actual decision processes, there were no gender differences which show the same patterns as found in their systematism ratings. This suggests that males and females may have different views concerning what is the systematic examination.

Subjects were also asked to estimate the proportion of the information examined in making allocation decisions. There was a significant main effect of the applicant population on their estimates, $F(1, 63) = 6.09, p < .05$. Subjects who examined 8 applicants estimated a higher proportion ($M = 83.1\%$) than those who examined 16 applicants ($M = 69.0\%$), $F(1, 63) = 6.09, p < .05$. As derived from Table 6.2a, on average, both estimates were below the actual proportions (90% for 8 applicants; 75% for 16 applicants).

In sum, subjects believed that the time and the amount of their examination of applicants' information were sufficient regardless of the amount of information available, although the amount of information affected the sufficiency of the information the subjects in fact examined. Also, the result suggests that males and females may have different criteria about the systematism of examining information.

What is important in procedural fairness judgment? Did subjects consider their procedures fair because they believed that they examined information sufficiently, or because they believed that they examined it systematically? To answer this question, a multiple regression analysis was conducted with these self-evaluations as predictors of

procedural fairness judgement. The four self-evaluations of information examination -- the sufficiency of the amount of information examined, the sufficiency of time spent to make decisions, the systematism of examining information, and the estimated proportion of the information examined -- were entered in the equation as predictors of procedural fairness ratings.

For both males and females, a significant proportion of the variance in the rating of procedural fairness was explained by these predictors, $R^2 = .32$, $F(4, 40) = 4.70$, $p < .001$ and $R^2 = .49$, $F(4, 21) = 4.99$, $p < .001$, respectively. Among the four predictors, the rating of the systematism of examining information was statistically significant, in males' ratings and in females' ratings, $t(40) = 2.54$, $p < .05$ and $t(22) = 4.03$, $p < .001$, respectively.

As noted earlier, when the predictors are highly correlated with each other, some of them may not be statistically significant even though they may contribute to the prediction of the criterion variable. In order to assess the relationships among variables, a simple correlation was calculated for each pair of variables (see Table 6.6a). For females, only the systematism of examining information was significantly correlated with the procedural fairness. For males, the rating of the systematism and the ratings about the sufficiency of the amount and the time for making decisions were all moderately correlated with the rating of procedural fairness. These three self-evaluations were also correlated each other. That is, the systematism of examining information was generally the important variable to determine the procedural fairness judgment, and the sufficiency of the examination was also important for males.

The similar analysis was conducted in each of the four experimental conditions, using the Kendall rank-order correlation. In the High scarcity / Small population condition, there

Table 6.6a. Pearson correlations among procedural fairness and self-evaluations of decision processes in males and females.

Variables	Fairness of Procedures	Proportion of Examination	Sufficiency of Examination	Sufficiency of Time	Systematism of Examination
Fairness of Procedures	-	.00	.35*	.44**	.46**
Proportion of Exam.	.11	-	.30*	.14	.20
Sufficiency of Exam.	-.01	.55**	-	.62***	.43**
Sufficiency of Time	.18	.37	.65***	-	.31*
Systematism of Exam.	.65***	.14	.27	.57**	-

Note : $n = 45$ for males and $n = 27$ for females. The values above the diagonal are for males and those below the diagonal are for females.

* $p < .05$. ** $p < .01$. *** $p < .001$.

were a few moderate correlations among the four self-evaluations. However, none of these self-evaluations was significantly correlated with the rating of procedural fairness, (see Table 6.6b). In the other three conditions (see Table 6.6b and 6.6c), although there were several statistically significant correlations among the evaluations, only the systematism of examining information was correlated with the procedural fairness.

In sum, when subjects generally believed that they looked at the applicants' information in a systematic way, they also judged their decision procedures fair, except when a highly scarce resource was to be allocated in a relatively small applicant population. In this condition, the procedural fairness was related to none of the self-evaluations. For males, the sufficiency of examination was also correlated with the procedural fairness in addition to the systematism.

6.7 Relationships between adjudicators' decision making and their evaluations

As reported in the previous section, systematic examination of information seemed more highly related to the judgements of procedural fairness than any other predictors. On what aspects of the actual decision making processes did the subjects evaluate the systematism? Were the subjects' estimates of information examined accurate? In attempting to answer these questions, a correlation was calculated between each of the decision making indices and each of the self-evaluations of their decision processes.

What affects adjudicators' judgment of sufficiency of information examined? In order to determine when subjects evaluated their examination of applicants' information as sufficient, a correlation was calculated between their sufficiency rating and each of the decision making indices regarding the amount of information examined. Males who ignored less information also rated themselves higher on sufficiency of examination, $r = -.30$, $t(43) = 2.02$, $p < .05$. Females' rating of the sufficiency of their examination was not

Table 6.6b. Kendall rank-order correlations among procedural fairness and self-evaluations of decision processes in the Small population conditions.

Variables	Fairness of Procedures	Proportion of Examination	Sufficiency of Examination	Sufficiency of Time	Systematism of Examination
Fairness of Procedures	-	.07	.04	.13	.27
Proportion of Exam.	.14	-	.42*	.01	.39*
Sufficiency of Exam.	.28	.44*	-	.44*	.42*
Sufficiency of Time	.31	.18	.55**	-	.37*
Systematism of Exam.	.70**	.12	.44*	.51**	-

Note : $n = 18$ for each condition. The values above the diagonal are for the High scarcity condition and those below the diagonal are for Low scarcity condition.

* $p < .05$. ** $p < .01$.

Table 6.6c. Kendall rank-order correlations among procedural fairness and self-evaluations of decision processes in the Large population conditions.

Variables	Fairness of Procedures	Proportion of Examination	Sufficiency of Examination	Sufficiency of Time	Systematism of Examination
Fairness of Procedures	-	.07	.16	.21	.34*
Proportion of Exam.	-.11	-	.40*	.26	.28
Sufficiency of Exam.	.19	.53**	-	.55**	.43*
Sufficiency of Time	.31	.40*	.59**	-	.58**
Systematism of Exam.	.52*	.22	.18	.11	-

Note : $n = 18$ for each condition. The values above the diagonal are for the High scarcity condition and those below the diagonal are for Low scarcity condition.

* $p < .05$. ** $p < .01$.

significantly correlated with any of the decision making indices. Kendall rank-order correlations between decision making indices and the sufficiency rating were computed in each of the four conditions. None of the decision making indices was significantly correlated with the rating of the sufficiency of examination. Thus, the subjects, particularly females, did not seem to evaluate the sufficiency of the examination based on their actual amount of information they examined.

In order to assess the accuracy of subjects' estimates of the proportion of information they examined, a regression analysis was conducted with their actual proportion of information examined as a predictor of their estimates. If all subjects estimated the proportion of the examined information with perfect accuracy, the regression of the actual proportion (X) on the estimates (Y) would be $Y = X$. As the slope of the equation is closer to 1 and the intercept is closer to 0, the estimates can be considered more accurate. As indicate in Table 6.7, subjects' estimated proportion of information examined was indeed related to their actual proportion of information examined, judging from the values of the R^2 . The slopes and the intercepts indicate that females' estimates were less accurate compared to males' estimates. The estimates by subjects in the Large population condition were less accurate than the estimates by those in the Small population conditions.

Recall that the evaluation of the sufficiency of examination was significantly related to estimated proportion of information examined (see Table 6.6a-c) , but not with any decision making indices regarding the amount of information examined. That is, subjects may have evaluated the sufficiency of their information examination based on their own estimates of examined information rather than the actual proportion of information they examined. Particularly when the applicant population was larger, the subjects' estimates were poorer. If they evaluated the sufficiency of their information examination based on these poorer estimates, it is likely that the subjects judged their information examination

Table 6.7. Accuracy of estimated proportion of information examined.

A Simple Regression Equation				
X = Actual Proportion: Y = Estimated Proportion				
Subjects	Slope	Intercept	R ²	F-value
Males	0.9	-1.9	.64	76.17**
Females	0.5	34.5	.17	5.04*
High / Small	1.0	-6.8	.60	24.21**
Low / Small	1.1	-19.2	.58	21.86**
High / Large	0.7	24.9	.34	8.08*
Low / Large	0.6	23.5	.28	5.68*

Note : $n = 45$ for males, $n = 27$ for females and $n = 18$ for each experimental condition.

* $p < .05$. ** $p < .01$.

sufficient regardless how much information they in fact examined.

What affects adjudicators' judgment of systematism? In order to examine what aspects of decision making were related to subjects' evaluation of the systematism of the examination, a correlation coefficient between the systematism rating and each of the decision making indices was calculated. Males and females seemed to judge their information examination systematic based on different aspects of their decision making. Males considered their information examination more systematic when they employed item-by-item heuristic more often (i.e., examining information of different applicants along certain item, such as Applicant A's "Age," Applicant B's Age,"...), $r = -.32$, $t(43) = 2.18$, $p < .05$. Female subjects considered their information examination more systematic when they re-examined information less often and cancelled acceptance of applicants more often ($r = -.43$, $t(25) = 2.41$, $p < .05$ and $r = .40$, $t(25) = 2.20$, $p < .05$, respectively).

A similar analysis was conducted in each experimental condition using a Kendall rank-order correlation. In the High scarcity / Large population condition, subjects believed that their decision making was more systematic when they did not changed rejections often, $r_k = -.43$, $p < .05$. In the other three conditions, none of the decision making indices was significantly correlated with the rating of systematism.

What affects adjudicators' judgment of sufficiency of time? The rating of the sufficiency of time spent for decisions was examined in relation to the indices of decision making. Males' rating of the sufficiency of time was not related to any of the decision making indices, but female subjects who cancelled acceptance of applicants more often believed that their time spent was more sufficient, $r = .42$, $t(25) = 2.34$, $p < .05$. Kendall rank-order correlations indicate that the sufficiency rating of time was not significantly correlated with any decision indices in each of the four experimental conditions, except in

one case. In the High scarcity / Large population condition, subjects believed that their time spent for decisions was more sufficient when they cancelled the rejections less frequently, $r_k = -.43$, $p < .05$. In sum, the sufficiency of the time spent for decision making was not related to the indices of actual decision making, except in a few cases. It cannot be determined in general when subjects evaluated that they spent enough time in making decisions.

When do adjudicators consider their procedures fair? In order to determine what aspects of decision making processes are related to the judgment of procedural fairness, the correlation was computed between the rating of procedural fairness and each of the decision making indices. Males' rating of procedural fairness was not correlated with any of the indices. On the other hand, females who cancelled acceptance of applicants more frequently judged their decision procedures fairer ($r = .39$, $t(25) = 2.12$, $p < .05$).

Subjects in the High scarcity / Small population condition who accepted applicants more often ($r_k = .52$, $p < .05$) and changed these acceptances more frequently ($r_k = .54$, $p < .01$) considered that their decision making procedures were fairer. In the High scarcity / Large population condition, the subjects judged their decision procedures fairer when they cancelled rejections of applications less often ($r_k = -.39$, $p < .05$). In the Low scarcity / Small population condition, none of the decision making indices was related to the rating of procedure fairness. In the Low scarcity / Large population condition, the subjects judged their decision procedures fairer when they employed item-by-item heuristic more often ($r_k = -.41$, $p < .05$). These results suggest that, when subjects had to examine 16 applicants, how the subjects could eliminate applicants (e.g., less cancellation of rejections and more use of item-by-item heuristic) may be important for their judgment of procedural fairness.

6.8 Summary of Study 1

The purpose of Study 1 was to examine how adjudicators make allocation decisions

and how they judge the fairness of their own decision making. The results of this study indicate that most people believe that student loans should be distributed among applicants according to their needs. In addition, applicants' efforts and abilities are also important. There was little gender difference in the relative importance of the different distributive philosophies, but different allocation situations seemed to affect the importance of philosophies: the need principle is more important when there are more people applying for a resource, and the ability principle is less important when the scarcity of resource is high. These three principles (need, ability and effort) seemed to be considered independent rather than conflicting. Application items related to expenses, needs, and incomes were considered most important in loan decisions. Although there were no reliable gender differences in distributive philosophies, more females than males tended to consider applicants' need-description as an important criterion, but more males considered applicants' GPA important. The result also suggests there is no simple one-to-one relation between application items and distributive philosophies, and that the relation varies among individuals.

The experience of making the allocation decision seems to change the importance of decision principles. In general, the importance of the distributive philosophies did not increase, but rather some philosophies such as the ability principle and the effort principle become less important. On the other hand, a few application items such as need-description and investments became more important, especially for male subjects. Also, the experience of making the decisions increased the agreement among individual adjudicators on which application items should be considered in loan decisions.

The results of this study also indicate some characteristics of adjudicators' decision making processes. As suggested by decision making studies, it was found that, when

there are larger number of applicants to be examined, decisions tend to be made based on less sufficient examination of applicants. When adjudicators have a larger number of applicants, they concentrate on only certain application items and ignore a larger part of information. On the other hand, the degree of resource scarcity was found to have little influence on adjudicators' decision making process. Nevertheless, the results suggest that adjudicators selectively examine applicants' information by focusing on only part of the applicant population when a resource is scarce. Also, when a resource is scarce, adjudicators would change the acceptances frequently if they find more deserving applicants before they reach a final decision. However, this flexibility in their decisions was not observed when there were a large number of applicants; suggesting that commission errors may not be corrected when there are a large number of applicants to be examined.

Though there are differences in adjudicators' decision making processes and in the importance of different allocation principles depending on resource scarcity and number of applicants, the results indicate that adjudicators would judge their decision making is fair regardless of these differences. The results also suggest that, even though adjudicators may acknowledge that they did not accept some applicants who are deserving, they do not consider that these omissions of deserving applicants were their decision errors which would reduce the fairness of their decision making. The overall fairness of their own decision making is related to fairness of allocation principles and procedures, although fairness of procedures does not seem related to the actual decision making processes.

It was found that fairness of decision procedures can be influenced in several ways. In general, the systematism of examining information was an important aspect for adjudicators in judging their own decision procedures, although the adjudicators' self-evaluation of systematism may not reflect any of their actual decision processes. In

allocating a resource in a large applicant population, how to eliminate applicants would also be critical for adjudicators' in judging the fairness of their own procedures.

Chapter 7: Results of Study 2

Study 2 was conducted in order to determine how observers judge the fairness of allocation decisions made by adjudicators. Recall that the observers in Study 2 were, in fact, the adjudicators of Study 1. Each returned for his or her observation session a few days after his or her adjudication session and assessed a previous adjudicator assigned from his or her own scarcity and applicant population condition in a yoked-control design. All observers were shown which applicants their adjudicator had accepted (i.e., decision outcomes). One third of the observers in each condition were also shown what kinds of distributive philosophies and application items the adjudicator considered important (i.e., decision principles). One third were shown how the adjudicator examined applicants' information before reaching a final decision (i.e., decision procedures). And one third were shown both the decision principles and the procedures of their adjudicator. This experimental manipulation was termed kind of information observed, and its three levels were respectively named (1) Principles Only, (2) Procedures Only, and (3) Principles and Procedures.

The results of Study 2 are presented in three sections: 1) how observers judge the fairness of adjudicators' decision making; 2) how observers evaluate the adjudicators' decision processes; and 3) how observers' fairness judgments are related to the similarity between themselves and adjudicators. Most analyses of the results are of two types. Four-way ANOVAs (resource scarcity x applicant population x information observed x gender) were conducted to examine mean differences of fairness judgments among the experimental conditions and between genders. In addition, Kendall rank-order correlations were computed to determine relationships among various fairness judgments and relationships

between observers' fairness judgments and adjudicators' actual decision making. Although both types of analyses indicate some statistically significant results, the results of correlational analyses proved more interesting and meaningful than are the results of ANOVAs.

7.1 Observers' fairness judgments

A subject (observer) was told to judge the fairness of the allocation decision made by other subject (adjudicator) in terms of its overall fairness, fairness of principles, procedures and outcomes. These fairness judgments were first analyzed by ANOVAs¹ and then analyzed by Kendall's taus. Observers' comments regarding adjudicators' decision making were also analyzed in order to assess the observers' concerns in judging the fairness of adjudicated allocations.

How fair do observers judge adjudicators' decisions? Each observer rated overall fairness, fairness of principles, and fairness of procedures of adjudicators' allocation decision on 7-point scale, from -3 (Very unfair) to +3 (Very fair). An ANOVA shows a three-way interaction of scarcity x kind of information x gender in the overall fairness rating, $F(2,48) = 5.44, p < .01$. There was a simple interaction of scarcity x kind of information in females' rating, $F(2,48) = 4.44, p < .05$. Females' ratings in the two scarcity conditions were significantly different only in the Principles and Procedures condition, $F(1,48) = 4.52, p < .05$ (see Figure 7.1a). The mean rating by male observers was +0.8, and there were no reliable differences in males' ratings across the conditions.

¹In general, 2 (scarcity) x 2 (applicant population) x 3 (information observed) x 2 (gender) ANOVAs were employed. However, 2 x 2 x 2 x 2 ANOVAs were conducted on the ratings about procedures (or principles) because the subjects in the Principles Only (or Procedures Only) condition, were not provided the information about adjudicators' procedures (or principles) and thus did not rate their fairness.

Figure 7.1a. Overall fairness judgments of observers.

A significant scarcity x kind of information x gender interaction was also obtained for rating of procedural fairness, $F(2,48) = 6.69, p < .01$. A simple interaction of scarcity x kind of information was significant only in females' rating, $F(1,32) = 17.89, p < .01$. As shown in Figure 7.1b, in the Principles and Procedures condition, procedural fairness ratings by females were significantly different between the two scarcity conditions, $F(1, 32) = 4.20, p < .05$. Male observers generally judged the adjudicators' decision procedures slightly fair across the conditions ($M = +0.8$). Two interactions found in the ratings of overall fairness and procedural fairness show the similar tendencies, suggesting the possibility that these two ratings may be related in observers' fairness judgments. The results of testing this possibility will be reported in the later section.

There were no reliable differences in the fairness ratings of decision principles among the experimental conditions or between genders. The mean fairness ratings were +0.7 for the distributive philosophies and +0.4 for the application items.

Subjects were asked to list which deserving applicants their adjudicator did not choose (omission errors) and which undeserving applicants the adjudicator did choose (commission errors). On average, subjects reported 19% of the applicants the adjudicator did not accept as omission errors and 27% of the adjudicator's accepted applicants as commission errors. No significant differences were found among the experimental conditions. Although there was no significant gender difference in the amount of reported omission errors, males listed marginally more commission errors ($M = 32\%$) than did females ($M = 19\%$), $F(1, 48) = 3.48, p = .06$.

Figure 7.1b. Procedural fairness judgments of observers.

In sum, male observers judged the adjudicators' allocation decision slightly fair, regardless of the different conditions, and tended to report more commission errors compared to females. Female observers also judged the adjudicators' decision principles slightly fair across different allocation situations, but they rated high on the overall fairness and the procedural fairness of the adjudicators' allocation decision in some conditions.

Do people consider their own decisions to be better than others? Because each subject was both an adjudicator (in Study 1) and observer (in Study 2), self-ratings of decision fairness could be compared to ratings of the fairness of the observed adjudicator's decisions. Self-ratings were subtracted from adjudicator ratings. A positive score indicates that the subject judged the other's decision making fairer than his or her own, whereas a negative score indicates that he or she judged the other's less fair.

ANOVAs of the rating differences indicate that there were interactions of resource scarcity x kind of observed information x observers' gender in the self-other differences of overall fairness ratings and procedural fairness ratings, $F(2, 48) = 4.67, p < .05$ and $F(1, 32) = 19.46, p < .01$, respectively. As seen in Figure 7.1c and Figure 7.1d, on average, males judged the others' decision making less fair than their own ($M = -0.7$ and $M = -1.0$ for overall fairness and procedural fairness, respectively), and these self-other differences did not vary significantly across the experimental conditions. However, females in some conditions judged others' decisions as fairer than their own, while females in other conditions judged the procedural fairness and overall fairness of others' decision as less fair than their own.

Figure 7.1c. Self-other differences in overall fairness judgments.

Figure 7.1d. Self-other differences in procedural fairness judgments.

Subjects, on average, judged the others' decision principles as less fair than their own ($M = -0.8$ for both the fairness of distributive philosophies and the fairness of application items). In addition, they reported that the others made 27% more commission errors than they did. There were no significant differences among the experimental conditions or between genders. There was, however, a significant interaction of applicant population $\times$ kind of observed information in the self-other difference in the percentage of omission errors, $F(2, 48) = 6.10, p < .01$. As seen in Figure 7.1e, most of the subjects reported more omissions of deserving applicants in others' decisions than in their own, except in one condition.

In sum, subjects generally judged others' decision making less fair than their own and identified more decision errors in the others' decision making. However, this tendency varied in its degree across the different situations, and subjects, particularly females, judged others' decision making fairer than their own in some situations.

What is important in overall fairness judgment: principles, procedures or outcomes?

In order to determine relative importance of principles, procedures and outcomes in observers' overall fairness judgment, Kendall rank-order correlations were computed among their ratings of overall fairness, fairness of principles (i.e., distributive philosophies and application items), procedures, and outcomes (commissions and omissions).

As seen in Table 7.1a, the results suggest that both males and females tend to judge the overall fairness of adjudicators' decision making mainly based on the judged fairness of decision principles, particularly the fairness of application items, and partially based on the judged procedural fairness. However, when the information about decision principles was not available (i.e., in the Procedures Only condition), the reported decision errors were more predictive of males' overall fairness judgment than their fairness of procedures.

Figure 7.1e. Self-other differences in reported omissions of deserving applicants.

Table 7.1a. Kendall rank-order correlations between overall fairness and fairness of principles, procedures and outcomes in male and female observers.

Condition		Gender of Observers	
		Males	Females
Principles & Procedures ^a	Philosophies	.39*	.76
	Items	.54**	.80*
	Procedures	.38*	.80*
	Commissions	-.08	-.59
	Omissions	-.28	-.53
Principles Only ^b	Philosophies	.32	.12
	Items	.45*	.81**
	Commissions	-.31	-.29
	Omissions	-.03	-.05
Procedures Only ^b	Procedures	.27	.57*
	Commissions	-.58**	-.33
	Omissions	-.45*	.04

^a $n = 19$ and 5 for males and females.

^b $n = 13$ and 11 for males and females.

* $p < .05$. ** $p < .01$.

whereas the judged fairness of procedures was more predictive of females' overall fairness judgment. None of the inter-correlations among the fairness judgments of principles, procedure and outcomes was statistically significant.

Correlations were also computed among the fairness judgements in each of the experimental conditions. As seen in Table 7.1b, reported decision errors were more related to the overall fairness judgment than the judged fairness of principles and procedures when resource scarcity was high. Only in the High / Large / Principles and Procedures condition, there were a few significant inter-correlations among the fairness judgements of principles, procedures and outcomes: the number of reported omissions was correlated positively with the number of commission errors ($r_k = .73, p < .05$) and negatively with the procedural fairness ratings ($r_k = -.75, p < .05$); the number of reported commission errors was negatively correlated with the fairness of application items ($r_k = -.73, p < .05$) and with the fairness of procedures ($r_k = -.70, p < .05$). All of these variables were significantly correlated with the overall fairness ratings.

When resource scarcity was relatively low (see Table 7.1c), the judged fairness of principles, particularly the fairness judgment of application items, was related to the overall fairness judgment whenever the information about decision principles was available (i.e., in the Principles and Procedural condition and in the Principles Only condition). When the information about principles was not available (i.e., in the Procedures Only condition), it was found that the number of reported commissions of undeserving applicants as most predictive of observers' overall fairness rating. There were no inter-correlations among fairness judgments of principles, procedures and outcomes, except in two case: in the Low / Small / Procedures Only condition, the judged fairness of procedures was negatively correlated with the number of reported commission errors ($r_k = -.80, p < .05$); in the Low / Small / Principles Only condition, the judged fairness of distributive philosophies was

Table 7.1b. Kendall rank-order correlations between overall fairness and fairness of principles, procedures and outcomes in the High scarcity conditions.

Condition		Applicant Population	
		Small	Large
Principles & Procedures	Philosophies	.15	.25
	Items	.31	.74*
	Procedures	.30	.77*
	Commissions	.09	-.92**
	Omissions	-.67*	-.84*
Principles Only	Philosophies	.64	.08
	Items	-.50	.59
	Commissions	-	-.68*
	Omissions	-.82*	-.50
Procedures Only	Procedures	.21	.00
	Commissions	-	.00
	Omissions	-.55	-.61

Note: $n = 6$ in each condition.

* $p < .05$. ** $p < .01$.

Table 7.1c. Kendall rank-order correlations between overall fairness and fairness of principles, procedures and outcomes in the Low scarcity conditions.

Condition		Applicant Population	
		Small	Large
Principles & Procedures	Philosophies	.80*	.48
	Items	.69*	.88**
	Procedures	.59	.59
	Commissions	-.46	.17
	Omissions	-.62	.59
Principles Only	Philosophies	-.09	.60
	Items	.70*	.67*
	Commissions	.00	-.36
	Omissions	.48	-.44
Procedures Only	Procedures	.57	.54
	Commissions	-.80*	-.65*
	Omissions	-.18	.40

Note: $n = 6$ in each condition.

* $p < .05$. ** $p < .01$.

negatively correlated with the number of commissions ($r_k = -.85$, $p < .01$).

In sum, the results suggest that, in general, decision outcomes and application items are two important aspects for observers in judging the overall fairness of the adjudicated allocation. In the case of high resource scarcity, the outcomes are more important, whereas the application items are more important when scarcity is relatively low. The results also suggest, however, that fairness of adjudicators' decision procedures more than outcomes are important for female observers.

Comments on adjudicators' decision making. Finally, subjects were asked for comments about the adjudicators' decision making². In order to assess how observers describe the fairness or unfairness of the adjudicators' decision making, subjects' comments were briefly analyzed by categorizing them into three groups. The groups reflected the three aspects of allocation decision making: principles, procedures and outcomes.

As seen in Table 7.1d, only a few comments were concerned with distributive philosophies, expressing the disagreement with the adjudicators' importance ratings (e.g., I think the judge should had placed more emphasis on the applicants' accomplishments and efforts). More comments were concerned with the fairness of the application items that adjudicators examined in making their decisions. More males than females stated that sex, age, and marital status should not be looked at or should be less important ($\chi^2 (1, N = 124) = 4.70$, $p < .05$). Some males and females stated that economic situations of the applicants should be examined more for the assessments of their true needs, and some comments were concerned with the importance of the academic achievement, such as GPA.

²A complete list of observers' comments is available in Appendix M.

Table 7.1d. Observers' comments on adjudicators' decision making.

Categories	Percentage	
	Males (n = 36)	Females (n = 24)
Principles	56.2	55.0
Philosophies	4.1	3.9
Application Items	52.1	51.1
Sex, Age, Marital Status	16.4	3.9*
Academic Achievement	8.2	9.9
Economic Indices	16.4	13.7
Other	11.0	23.5
Procedure	21.9	21.6
Sufficiency of Examination	13.7	9.8
Systematicness of Examination	4.1	9.8
Other	4.1	2.0
Outcomes	21.9	23.5
Commission errors	13.7	3.9
Relative deservingness	2.7	15.7**
Other	5.5	3.9
Total Comments	73	51

* $p < .05$, ** $p < .01$ for gender differences.

As seen in Table 7.1d, about 20% of the comments were related to the adjudicators' decision procedures, such as the sufficiency and the systematism of the adjudicators' information examination. Fifty-five percent of these comments were negative (e.g., ignoring some information, rushing into decisions, and jumping from one piece to another). Forty-five percent of the comments were positive (e.g., examining enough information).

About 20% of the comments were concerned with decision outcomes. Males often remarked that adjudicators accepted undeserving applicants (i.e., commission errors). Compared to males, more females stated that the applicants accepted by the adjudicators were deserving but there were other more deserving applicants (i.e., relative deservingness), $\chi^2(1, N=124) = 6.79, p < .01$.

In sum, the brief examination of subjects' comments suggests that when observers judge the fairness of the adjudicators' allocation, the observers most often mention the fairness of application items, then mention the fairness of the outcomes and procedures of the adjudicators' decision making. Few of their comments concern the fairness of distributive philosophies.

7.2 Observers' evaluations of decision making

After observing the information seeking behavior of their adjudicators, subjects in the Principles and Procedures condition and in the Procedures Only condition were asked to rate on a scale from -3 to +3 how sufficiently and systematically the adjudicators examined the applicant information. The effects of the experimental manipulations and gender on these evaluations were analyzed by four-way ANOVAs. Analyses were also conducted to determine the relationships among these decision making evaluations and the procedural fairness.

How do observers evaluate adjudicators' allocation decision making? An ANOVA of the rating of the sufficiency of examination indicates a significant interaction of resource scarcity x observed information, $F(1, 32) = 5.54, p < .05$. In the Procedures Only condition, the sufficiency ratings varied between the two scarcity conditions, $F(1,32) = 4.24, p < .05$, as seen in Figure 7.2. In the ratings of the systematism in examining information, there was no reliable difference among the conditions nor between genders. The mean rating was +0.8. Subjects indicated that adjudicators examined information not particularly in systematic ways but that they did examine a sufficient amount of it in some cases.

Did subjects evaluate the adjudicators' information examination as more sufficient when the adjudicators in fact examined more? When did they evaluate that the information examination was systematic or unsystematic? In order to answer these questions, the relationships between observers' evaluations and adjudicators' decision making process were examined by Kendall rank-order correlations. There were no significant correlations between observers' sufficiency ratings and any indices of the amount of information examined by the adjudicators (e.g., the number of looks, the amount of re-examination). The systematism ratings of female observers were correlated with two aspects of the adjudicators' decision making: as adjudicators made acceptances less often and changed them less often, females rated their examination as more systematic (in the Procedures Only condition, $r_k = -.60, p < .05$ and $r_k = -.60, p < .01$, respectively). Male observers, however, showed no significant correlations between adjudicators' actual information examination and its systematism. Neither were there significant correlations between the systematism ratings and the decision indices in any of the experimental conditions. These results suggest that observers, particularly males, may be insensitive to what the

Figure 7.2. Observers' evaluation of sufficiency of adjudicators' information examination.

adjudicators actually did in making decisions. Alternatively, the results suggest that individual observers may have very different beliefs about the definitions of systematic and sufficient examination.

What is important in judging procedural fairness? In order to determine if observers' sufficiency and systematism evaluations are related to their judgment of procedural fairness of the adjudicators' decision, Kendall rank-order correlations were computed between the procedural fairness rating and judgements of both examination systematism and sufficiency. As seen in Table 7.2a, the ratings of procedural fairness, sufficiency and systematism are significantly correlated with each other, except for males in the Procedures Only condition.

Kendall rank-order correlations were also calculated in each of the experimental conditions. As seen in Table 7.2.b, in the Principles and Procedures condition, these three ratings concerning adjudicators' decision procedures were significantly correlated, except in one case (ratings of sufficiency and systematism in the Low / Large condition). In contrast, only two significant correlations were found in the Procedures Only condition.

The relationships between observers' procedural fairness judgment and adjudicators' decision making processes were examined by Kendall rank-order correlations. Female observers in the Procedures Only condition judged the adjudicators' decision procedures as less fair when the acceptance of applicants were cancelled more frequently ($r_k = -.59$, $p < .05$). In the High scarcity condition, observers judged the adjudicators' procedures as less fair when the rejections of applicants were cancelled less often ($r_k = .69$, $p < .05$ in the Small / Procedures and $r_k = .74$, $p < .05$ in the Large / Procedures). The frequency of changing decisions seems influential for the fairness of decision procedures.

Table 7.2a. Kendall rank-order correlations among evaluations of adjudicators' decision procedures in male and female observers.

Condition		Gender of Observers	
		Males	Females
Principles & Procedures ^a			
Procedural Fairness	Sufficiency	.57**	1.00**
	Systematism	.53**	.83*
Sufficiency	Systematism	.60**	.83*
Procedures Only ^b			
Procedural Fairness	Sufficiency	.16	.78**
	Systematism	.08	.74**
Sufficiency	Systematism	.38	.58*

^a $n = 19$ and 5 for males and females.

^b $n = 13$ and 11 for males and females.

* $p < .05$. ** $p < .01$.

Table 7.2b. Kendall rank-order correlations among observers' evaluations of adjudicators' decision procedures in each experimental condition.

Conditions		Variables	Applicant Population	
			Small	Large
Principles & Procedures				
High scarcity	Procedural Fairness	Sufficiency	.93**	.65*
		Systematism	.65*	.65*
	Sufficiency	Systematism	.65*	.77*
Low scarcity	Procedural Fairness	Sufficiency	.74*	.65*
		Systematism	.79*	.74*
	Sufficiency	Systematism	.96**	.59
Procedures Only				
High scarcity	Procedural Fairness	Sufficiency	.25	.83*
		Systematism	.59	.59
	Sufficiency	Systematism	.62	.65*
Low scarcity	Procedural Fairness	Sufficiency	.62	.37
		Systematism	.22	.36
	Sufficiency	Systematism	-.08	.45

Note: $n = 6$ in each condition.

* $p < .05$. ** $p < .01$.

In sum, observers' evaluations about the adjudicators' information examination was related to the judgement of procedural fairness of their decision making, particularly for female observers. However, when observers judged the adjudicators' decision making without knowing its decision principles, these evaluations were rarely related to the procedural fairness. Nevertheless, the cancellation of rejections was found to be positively related to procedural fairness when the resource scarcity was high.

7.3 Observers' fairness judgments and observer-adjudicator similarity

Similarities among people sometimes facilitate positive evaluations about each other. An observer may judge the adjudicator's decision making as fairer if it is similar to what he or she would do. Several analyses were conducted to determine the relationships between (1) observer-adjudicator similarities in their allocation decision making and (2) observers' fairness judgments of the adjudicators' allocation decisions. Their similarities were analyzed in three categories: decision principles, procedures, and outcomes. In each of these categories, several indices were calculated as the observer-adjudicator similarity.

Similarity in principles. An observer may judge an adjudicator's decision philosophies fair if the two agree on philosophical principles. The observer-adjudicator similarity in their ratings of the importance of distributive philosophies was examined in relation to the observer's fairness judgment of these philosophies.

An absolute difference of the importance ratings of each distributive philosophy between an observer and an adjudicator was first used as an index of dissimilarity. For example, if an observer considered that the ability principle is not important at all (i.e., -3 on the rating scale) and saw the adjudicator rating it as neutral (i.e., 0 on the scale), the observer-adjudicator dissimilarity score in the importance of the ability principle would then be 3. Recall that each subject was asked to rate importance of philosophies before and after making decisions. Thus, the dissimilarity indices were calculated using both the observer's

pre-decision ratings and the observer's post-decision ratings. However, only the adjudicators' pre-decision ratings were used in calculating the dissimilarity scores, because the observer was shown only pre-decision ratings as the adjudicator's decision principles.

Kendall rank-order correlations were calculated between the dissimilarity index of each philosophy and the fairness rating of distributive philosophies first for male and female observers and then in each experimental condition. No correlations were statistically significant, except one: males judged the adjudicators' distributive philosophies fairer when they had a more similar opinion about the ability principle ($r_k = -.37, p < .05$).

Suppose that an observer rated the ability principle as very important (e.g., 3 on the rating scale) and found that the adjudicator rated it only slightly important (i.e., 1 on the scale), then the dissimilarity index would be 2. However, the index would also equal 2 if the observer rated the ability principle slightly important (=1) and the adjudicator rated it very important (=3). Does the observer judge the fairness of the adjudicator's philosophies to the same degree in these two examples? In attempting to answer this question, another index was calculated: whether the observer rated a certain distributive philosophy more important or less important than the adjudicator did. The difference of an adjudicator's rating minus an observer's rating was computed for each of the five philosophies, and its relation with the fairness judgment was examined by a Kendall rank-order correlation. A positive correlation indicates that observers tend to judge adjudicators' philosophies fairer if the adjudicators rated a certain principle more important than the observers themselves did. In the example above, a positive correlation would be found when the adjudicator's philosophies are judged fairer in the latter case (i.e., the observer rating 1 and the adjudicator rating 3) but less fair in the former case (i.e., the observer rating 3 and the adjudicator rating 1).

In the Principles and Procedures condition, several positive correlations were found

in scores of need principles; both males and females rated the adjudicators' decision principles as fairer when the adjudicators rated the need principle more important than the observers themselves did ($r_k = .40, p < .05$ and $r_k = .35, p < .05$ using observers' pre-decision and post-decision ratings by males and $r_k = .80, p < .05$ using the pre-decision and post-decision ratings by females). This tendency was found in all conditions³ (the correlations ranged from $r_k = .66$ to $.91$ using the observers' pre- or post-decision ratings). In addition, the importance of the effort principle was positively related and the importance of the personality principle was negatively related to the fairness judgment in the two Low scarcity conditions (the correlations ranged from $r_k = .75$ to $.93$ and $r_k = -.82$ to $-.93$, respectively).

In contrast, in the Principles Only condition, the observer-adjudicator differences in the important philosophies were not significantly related to the observers' fairness judgments, except in a few cases: the correlations were significant between the difference of the importance of the need principle and fairness judgments by males ($r_k = .42, p < .05$ with post-decision rating), and in the Low scarcity / Large population condition ($r_k = .67, p < .05$ and $r_k = .69, p < .05$ with pre- and post-decision ratings, respectively).

In sum, observers generally judged the adjudicators' distributive philosophies fairer when the adjudicators rated needs as more important than did the observers. When the scarcity is relatively low, the effort principle and the personality principle were also taken into account in judging the fairness of adjudicators' decision principles. However, these results were found mostly in the Principles and Procedures condition.

Because each pair of adjudicators and observers had listed the five most important application items in Study 1, it was possible to determine how their item agreement

³In the High scarcity / Small population condition, the correlation could not be computed because of no variability in the dissimilarity index among subjects.

correlated with the observers' ratings of the fairness of adjudicators' principle. The application items commonly listed by each pair of observers and adjudicators were counted, and the number of such items was used as an index of similarity in the application items⁴.

There were significant correlations between the observer-adjudicator similarity of the important items and the observers' fairness judgment in the Principles Only condition. Here, both male and female observers judged the adjudicators' items fairer when the observers and adjudicators had more items in common ($r_k = .50$, $p < .05$ and $r_k = .75$, $p < .01$ for males and females using their pre-decision listing, respectively). In the High scarcity / Small population condition, the fairness of items was correlated with the number of common listings ($r_k = 1.00$, $p < .01$ and $r_k = .75$, $p < .05$ with pre- and post-decision listing). However, there were no significant correlations in the Principles and Procedures condition. Perhaps, when subjects could observe both principles and procedures, they may have also judged the fairness of the application items based on what the adjudicators did (i.e., their examination of the items) as well as what they indicated (i.e., their listing of importance items).

Similarity in procedures. Many different indices were used as the similarity of decision making procedures between a pair of subjects. For example, a "dissimilarity" index could be an absolute difference in the proportion of ignored information between the observer and the adjudicator. It could also be an absolute difference in the proportion of re-look, or an absolute difference in the frequency of making rejections, etc. It was found that these absolute differences in the decision indices between observers and adjudicators

⁴As conducted for the earlier analysis on the distributive philosophies, the similarity index was calculated in two ways: 1) using the adjudicator's pre-decision and the observer's pre-decision listings, and 2) using the adjudicator's pre-decision and the observer's post-decision listings.

were related to the observers' judgment of procedural fairness only in a few cases. In the High scarcity condition, observers rated the adjudicators' decision procedures as fairer when they were similar in the frequency of rejections ($r_k = -.69, p < .05$ in the Principles & Procedures / Large and $r_k = -.87, p < .01$ in the Procedures Only / Small) and in the frequency of changing these rejections ($r_k = -.69, p < .05$ in the Principles & Procedures / Large and $r_k = -1.00, p < .01$ in the Procedures Only / Small).

Suppose that a female observer thinks that it is important to look at a large amount of information and she looked at 500 pieces. An adjudicator, X, examined 400 pieces of information and adjudicator, Y, examined 700 pieces. In terms of the amount of information examined, she is more similar to the adjudicator X than to Y (i.e., her dissimilarity scores are $500 - 400 = 100$ with X and $700 - 400 = 300$ with Y). However, she may judge Y's decision procedures fairer than X's because the X examined more information than Y. To determine if there is such tendency, the direction of the differences must be considered. A few decision indices had significant correlations with observers' procedural fairness judgment. For example, females judged the adjudicators' procedures fairer when the adjudicators ignored less information ($r_k = -.55, p < .05$ in the Procedural information condition) and when the adjudicators examined the information in more systematic way than the observers themselves did ($r_k = .89, p < .05$ in the Principles and Procedures condition). Also, the observers' rating of procedural fairness was higher when the adjudicators changed their decisions more often than did the observers (with the changes of acceptance, $r_k = .71, p < .05$ in the Principles & Procedures/ Low / Large condition and with the changes of rejections, $r_k = 1.00, p < .05$ in the Principles & Procedures/ Low / Large condition and $r_k = .91$ in the Procedures Only / High / Small condition).

Finally, the overlap of the information examined was used as an index of the

observer-adjudicator similarity in their decision procedures. An observer may judge the adjudicator's decision process as fairer when the adjudicator examined the same information as the observer did. On the other hand, the observer may judge the adjudicator's decision process unfair when the adjudicator did not examine the information (e.g., Applicant C's "Description of Need"), which the observer examined (i.e., adjudicator's miss). The observer may also judge it unfair when the adjudicator examined information (e.g., D's gender) which the observer did not examine (i.e., adjudicator's excess). These misses and excesses of the adjudicator's information examination can be considered as its dissimilarity to the observer's examination.

These dissimilarity indices were related to the observers' fairness judgment only in one case. Female observers in the Procedures Only condition judged the adjudicators' decision procedures less fair when the adjudicators looked at more information which the observers did not look at ($r_k = -.51, p < .05$). In sum, although there were some significant correlations between the similarity in decision making processes and procedural fairness judgment in female observers and in some conditions, these relations were weak, particularly for male observers.

Similarity in outcomes. The relationships between observer-adjudicator similarity in their decision outcomes and decision errors reported by observers was analyzed. The similarity of their decision outcomes was defined as the number of applicants they both selected. In total, fifteen out of thirty-six pairs of subjects had no match in their accepted applicants. Eighteen pairs accepted one applicant in common. Three pairs of subjects accepted more than one common applicant. All these pairs were in the Low scarcity / Large population condition, in which they were asked to choose four out of sixteen applicants.

The number of decision errors identified by observers was compared between subjects who accepted at least one applicant in common with their paired subjects (with

match, $n = 42$) and those who did not (without match, $n = 30$). For both males and females, there were no differences in the amount of reported commission errors between those with match and those without match. Neither were there differences in female observers' judgments in the amount of reported omission errors. However, males in the Principles and Procedures condition specified more omission errors when they did not have any common applicants with their paired subjects, ($M = 19\%$) than when they accepted at least one applicant in common ($M = 9\%$), $t(11) = 2.17$, $p < .05$. An even stronger tendency was observed in the Procedures Only condition: male observers identified three-times more omission errors when they had no common applicants ($M = 32\%$) than when they had common applicants in their acceptance ($M = 10\%$), $t(11) = 3.37$, $p < .01$. This tendency was also found when a scarce resource was allocated in the large applicant population ($M = 9\%$ and 46% for with and without match), $t(4) = 10.84$, $p < .01$.

In sum, the adjudicator/observer decision agreement seemed to affect males' judgment of fairness of outcomes but not females' judgments. This tendency in male subjects was strong when they did not know about the adjudicators' decision principles.

7.4 Summary of Study 2.

Study 2 was conducted to determine how observers judge the fairness of adjudicators' decision making. Recall that the results of Study 1 suggest that the fairness of distributive philosophies and procedures are the two important aspects for adjudicators in judging the overall fairness of their own decision making. The results of Study 2 indicate that fairness judgments regarding philosophical principles is at best weakly related to judgements of the overall fairness of the adjudicated allocation. Instead, the decision outcomes and application items appear to be two important aspects for observers in judging the fairness of adjudicators' decision making. In particular, when resources were more scarce, the decision outcomes were more important, whereas the application items were

more important when the scarcity was relatively low.

The observers' evaluations about adjudicators decision procedures are also predictive of their overall fairness judgment in some cases. Yet, these procedural evaluations were rarely related to the adjudicators' actual decision making processes. In addition, there were some gender differences in the relative importance of decision procedures and outcomes in the fairness judgments of allocation decisions; outcomes were more important for males, whereas procedures were more important for females. Males tended to be more sensitive than females to adjudicators' acceptance of undeserving applicants. Males also tend to report omissions of deserving applicants based on their outcome commonality with adjudicators' decision.

Both males and females judged others' decision making as less fair on average than their own, and identified more errors in the others' decisions than in their own. Male observers judged the adjudicators' allocations as only slightly fair regardless the allocation situations. Females were sometimes more lenient than were males: although female observers judged the adjudicators' decision principles only slightly fair across the situations, they sometimes judged that adjudicators' decision procedures were quite fair and that the allocation was quite fair overall.

Chapter 8: Discussion

Two studies were conducted to investigate issues of fairness in adjudicated allocations: how adjudicators make allocation decisions, how they judge the fairness of their own decisions, and how observers judge the fairness of the adjudicators' decision making. In particular, the challenge of the present studies was to apply the concepts and the method in human decision making research for the issues of fairness. The present studies provide new insights about the possible influences of the nature of human decision processes on the fairness of allocations. In this chapter, I will discuss: 1) the influences of decision making factors on the fairness of adjudicated allocations; 2) adjudicators' fairness judgments of their decision making; 3) adjudicator-observer differences in the fairness judgments; 4) gender differences in the fairness judgments, and 5) the theoretical and methodological implications of the present studies to decision making research and psychological research on social justice.

8.1 What would threaten the fairness of adjudicated allocations?

The primary purposes of the present studies were to determine how adjudicators allocate a limited resource among applicants and to determine how allocation situations such as resource scarcity and applicant population influence the adjudicated allocation. Because an adjudicator is presumed to be a neutral party not requesting the resource, adjudicated allocations are expected to be fair and unbiased by self-interest in the resource. However, the examination of adjudicators' decision process suggests several factors which may vitiate the fairness of adjudicated allocations.

As noted earlier, an allocation situation becomes more competitive for two reasons: (1) the supply of the resource may decrease; (2) the demand may increase as it would when

more people apply for it. As an allocation becomes more competitive, obtaining the resource is more likely to be honorable or valuable for applicants, under the belief that they obtained it because they were qualified through a deliberate examination. However, the results of the present studies indicate that adjudicators' decision processes are likely to be influenced by the growth of applicant population and the increased scarcity of the resource, possibly resulting in arbitrary decision outcomes in such a competitive allocation. The results also show that these two situational factors have different psychological influences on adjudicators' decision making.

As a resource becomes more scarce, one would hope that allocation decisions are made more carefully in order to avoid wasting it on undeserving applicants. However, the results suggest that adjudicators do not increase their care in making allocations as scarcity increases, but instead they focus on only some of the applicants and give others only cursory examination.

As more people are applying for a resource, adjudicators examine less information per applicant before making a final decision. This finding is consistent with the tendency reported in other decision making studies (e.g., Payne, 1976; Klayman, 1985). The present results show that large part of the applicant information is ignored, only part of the application items are examined, and the information is re-examined less often. Ignoring more information may increase the probability of overlooking the information which may be critical for a fair allocation.

If there are some unimportant items in application forms, it may be efficient to ignore such items and examine only a part of the application information. In fact, decision making studies have found that this is a common strategy which experts generally employ. For example, Alba and Hutchinson (1987) found that consumers who are familiar with product decisions restrict their examination only to important information. Using only a part of the

information could be a reasonable heuristic (Johnson & Payne, 1985; Thorngate, 1980), but the fairness of the allocation can be maintained only if the selected items are truly important and fair to use in allocating a resource. The efficiency in decision making does not guarantee its fairness.

How can we decide which items are important for a fair allocation? One of the methods is to decide based on public opinion. Suppose that adjudicators publicize their decision principles, such as which decision criteria they are going to use in making an allocation. If people approve such criteria as fair guideline and the adjudicators examine applicants based on these approved criteria, the allocation decision might be judged fair even though the adjudicators ignore some information. However, the results of Study 1 show that adjudicators do not necessarily concentrate on the application items which they have indicated as important criteria. Jarvenpaa (1990) also found a weak relationship between subjects' examination of the information items and their stated importance of each. Thus, even if adjudicators' criteria are seen as fair, adjudicators may not actually use them in their decision making. Decision principles may not be coupled with practice, like the common discrepancy between people's attitudes and their behaviors (Cook, 1990; Wicker, 1969).

In the present allocation decision task, most of the subjects employed the alternative-by-alternative heuristic over the item-by-item heuristic. This result is inconsistent with the previous findings in human decision making research. Most decision making research suggests that decision makers detect characteristics of the decision situation and choose the best heuristic to process it. The first finding in decision making research is that the item-by-item heuristic is employed more often when more alternatives are available, because this heuristic reduces people's cognitive load by eliminating alternatives quickly (e.g., Payne,

1976; Olshavsky, 1979). However, in the present studies, subjects who had more applicants employed the alternative-by-alternative heuristic and eliminated applicants as often as did those who had fewer applicants. That is, even when adjudicators have more applicants to examine, adjudicators do not employ different heuristic in examining information but simply decrease the examination of applicants. It may not be necessary to search for a better heuristic to reduce the cognitive load in making decisions.

The second common finding of decision making research is that information is examined in the way in which it is organized, (Bettman & Kakker, 1977; Jarvenpaa, 1990). Thus, the alternative-by-alternative heuristic should be dominant when the information is organized along alternatives (e.g., information of each applicant is summarized on one page), whereas the item-by-item heuristic should be dominant when the information is organized along items (e.g., information about GPAs of all applicants is summarized on one page). In the present allocation task, however, the applicants' information was organized based on both alternatives (i.e., applicants) and application items. As found in Jarvenpaa (1990), two types of heuristics are expected to be employed to the same degree in such a decision task. However, the present result was inconsistent with the previous findings.

Why did subjects in the present studies employ the alternative-by-alternative heuristic more often than is found in decision making research? The alternative-by-alternative heuristic seems to represent the conventional method which is used in everyday life in selecting people for job, school, immigration, etc. Each applicant usually must fill out an application form which consists of several items, or he or she must attach various documents to the form which will be stored in an individual file. That is, the information is usually organized applicant by applicant. Examining applicants one by one may be a common method in selecting people, and subjects might have followed such a conventional

method. Most decision making research assumes that people mentally calculate the benefits of several heuristics and choose the optimum among them. However, if an adjudicator knows how decisions are made in a similar decision context, his or her decision making behavior may be governed more by habit or schema than by cognitive calculus¹ (Thorngate, 1979).

If adjudicators tend to follow conventional method, the same procedures and criteria would be used repeatedly, and thus the allocation process would become stable. The stability of the allocation method is sometimes considered as a desirable characteristic for a fair allocation (e.g., Lerner, Miller, Holmes, 1976; Leventhal, 1980; Leventhal, Karuza, & Fry, 1980). A certain allocation method can become stable only if such a method is preferred by members of a majority or a superior group which has power in society; they would change the method otherwise. The members in such a group would judge the allocations based on this method fair, but these may not be fair for others, such as minorities or groups with less power. If the stability of allocation method is legitimated as one factor for a fair allocation, there would be little hope for minorities or inferior groups to change the present allocation method from which they are suffering (Walster & Walster, 1975).

The flexibility of decision making process is considered as another criterion for a good decision in order to correct errors before the decision is confirmed (e.g., Beach & Mitchell, 1978; Leventhal, 1980). The present results show, however, that adjudicators do not change their decisions often. Even if there are some errors in their decisions, these

¹The definition of "cognitive behavior" seems to cover a wide range of human behavior. One may include even habits within cognitive behavior as automated or programmed responses. Nevertheless, it would be agreeable to consider that habitual behavior is less conscious and less cognitive compared to the deliberate choice of the optimal heuristic.

errors may not be corrected.

As illustrated by Einhorn (1978), in the case of the resource scarcity, two types of decision errors -- omissions of deserving applicants and commissions of undeserving applicants -- cannot be reduced simultaneously; the reduction of one type of error results in the increase of the other type. Adjudicators should consider which type of error would be more serious for a fair allocation. One possible criterion may be the difficulty in assessing the costs of each error. The cost of commission errors can be calculated from the values of the resource given to the undeserving applicants, whereas the cost of omission errors need to be calculated based on hypothetical situations: What if the applicants had been accepted? Thus, it may be more difficult to calculate the cost of omission errors than the cost of commission errors. Adjudicators may have to reduce omission errors more carefully than to reduce commission errors in order to avoid the expected difficulty. However, the results indicate that adjudicators would cancel rejections of applicants less frequently compared to the acceptance. This result suggests the lower probability of correcting omission errors than commission errors if any such errors exist in the decisions, and thus adjudicators may create more difficulties in obtaining feedback about the cost of errors.

The inter-judge consistency in the decision outcomes is also considered as a desirable characteristic (Leventhal, 1980; Einhorn, 1974). The results of the present studies show, however, that consistency of allocation outcomes is low across adjudicators. Allocations are unlikely to be judged fair if the outcomes varies to a large degree depending upon who is the adjudicator. One may suggest that if allocation principles and procedures are clearly defined and every adjudicator follows such principles and procedures, then the decision outcomes would become more consistent across the adjudicators. However, as indicated by the present studies, the decision outcomes may still have large variety even though the

adjudicators consider the similar decision principles important, have identical set of applicant information, and examine the information with the similar heuristic.

In sum, the present studies show that the two determinants of the competitiveness of allocation situations -- resource scarcity and applicant population -- influence differently adjudicators' decision making process. The results also indicate several characteristics of adjudicators' decision making process which may risk the fairness of adjudicated allocations, such as insufficient information examination, habitual decision procedures, inflexible decision making, and low inter-judge consistency in the decision outcomes.

8.2 Adjudicators' justification of allocation decisions

Adjudicators are expected to be fair, and are often asked to justify or to defend their allocation decisions. What would be the adjudicators' justification of their allocation decisions? The results indicate that adjudicators do judge their allocation to be fair and rarely report commission errors in their decision. Adjudicators acknowledge that some deserving applicants were not accepted, but they do not consider their allocation unfair despite of the omissions of deserving applicants, probably by attributing these omissions to the resource scarcity. This result is similar to the well-known tendency of actors' causal attribution: Actors tend to attribute their failures to environmental constraints (Jones & Nisbett, 1971).

One of the interesting findings in Study 1 concerns the adjudicators' focus in justifying the fairness of their allocation. The present results indicate that adjudicators claim that their allocation decision is fair because their philosophical decision criteria and procedures are fair. I would like to discuss these two aspects in adjudicators' justifications.

Distributive philosophies are moral ideals or normative rules which should be followed for a fair allocation. Sometimes, more than one philosophy is important to make

a fair allocation, but different philosophies often lead to conflicting prescriptions for allocation (Deutsch, 1975; Leventhal 1980). For example, a student who most needs financial support may have low academic achievement; another who has an excellent academic record may have low financial needs. In this case, an adjudicator cannot practise both need principle and ability principle simultaneously but must choose between them. However, at an abstract, philosophical level, it is still possible for the adjudicator to claim that both of the two philosophies are important for a fair allocation. In fact, subjects in the present studies considered that applicants' needs, abilities and efforts were all important, and their importance ratings of these principles were never negatively correlated. That is, subjects did not seem to notice the conflicting nature of the philosophical principles or the difficulties in practicing more than one distributive philosophy.

If these practical problems of philosophical principles are not recognized by applicants and/or observers, it would be successful for adjudicators to claim the overall fairness of their allocation decision by drawing people's attention to its philosophical fairness. This would be successful particularly if adjudicators emphasize the importance of distributive philosophies which are highly valued in society. The need principle may be one such philosophy. The need principle is best referred to as a norm of humanitarianism or social responsibility (Schwartz, 1975). Helping another who is in need or in jeopardy is considered as one of the natural duties of members in a group (Deutsch, 1975; Rawls, 1971). Subjects in the present studies considered the need principle most important, probably reflecting the characteristics of Canadian society, which highly values well-being of individuals. At the same time, however, the subjects also considered that applicants' abilities and efforts are important for a fair allocation. This may reflect another aspect of North American culture, where the stratification in society is considered as consequences of open competitions in which those displaying most ability and effort can receive the most

avored outcomes (Sampson, 1975).

Previous studies of distributive justice have found the effects of resource scarcity on the dominant principles in allocations (Karuza and Leventhal, 1976, see Leventhal, 1980; Saito and Sasaki, 1987). The present results indicate the effects of the allocation situation on the importance of philosophies to be different from the previous findings: the ability principle becomes less important as the resource becomes more scarce, and the need principle becomes more important as more people applying for a resource. It should be noted that the importance of principles in the present studies indicates subjects' moral ideal, whereas the importance of principles in the previous studies was an inference based on the allocation outcomes. Therefore, these results may be incomparable.

As mentioned earlier, procedural fairness was another critical aspect for adjudicators' to judge the overall fairness of their own decision making. Social psychological studies have found that procedural justice can function as "a cushion of support" for decisions with outcomes unfavorable to interested parties (e.g., Thibaut & Walker, 1975; Tyler, 1988). Procedural justice can thus help those who make decisions, such as adjudicators, judges, authorities, to persuade the applicants who do not receive a resource by distracting these applicants' attention from the decision outcomes (Lind & Tyler, 1988). The present studies support this idea in the context of adjudicated allocations; adjudicators could presumably use their own judgments of procedural fairness in justifying their allocation decisions.

When do adjudicators claim that their allocation procedures are fair? Examining sufficient information is generally considered as one characteristic of a good decision making. However, the present results suggest that the sufficiency of examination may not be an important aspect for adjudicators in justifying the fairness of their decision procedures. Adjudicators' self-evaluation about the sufficiency of their information

examination was not related to their self-evaluation of procedural fairness in most cases, and adjudicators considered that their procedures were quite fair even when they ignored much information.

Rather, it was found that adjudicators' belief concerning how systematically they examined the information is more predictive of their procedural fairness judgment. In turn, their systematic examination ratings were related to aspects of their decision processes, such as the use of the item-by-item heuristic in some cases. Although subjects did not employ the item-by-item heuristic frequently, when they did employ it, they considered that they examined the applicant information systematically and then their decision procedures and overall decision were fair. A similar tendency is found in Zakay (1985); the use of the item-by-item heuristic increases people's confidence in their decisions. This tendency is considered due to the non-compensatory nature of the item-by-item heuristic; people focus on one item at one time, and thus may not experience the same levels of conflicts caused by the existence of both positive and negative aspects in one alternative.

Decision making research suggests that judgements of the quality of a decision process may reflect the decision situation more than the actual decision process. One such situational factor is the availability of many alternatives. Having more alternatives gives a decision maker more satisfaction with his or her decision by reducing his or her feeling of uncertainty (Corbin, 1980). For example, Jacoby, Speller, and Kohn (1974) found that consumers are more satisfied with their decisions when they have more alternative products. These studies suggest that adjudicators may judge their allocation decision fairer when they had more alternative applicants. However, there were no differences in the judged procedural fairness or overall fairness due to the size of the applicant population. Adjudicators' fairness judgments may be determined by psychological factors other than the satisfaction with their own decisions. Alternatively, in allocation decisions, the increase

of alternatives (i.e., applicants) may function differently from how it does in other decision situations. For example, in the consumer decisions, a consumer is not obliged to examine all of the available products. If he or she finds a satisfactory product and likes it, he or she may judge that his or her choice is a good buy. However, in allocation decisions, an adjudicator is usually obliged to examine every applicant at least once; otherwise, his or her allocation decision is likely to be judged unfair. Thus, the existence of more applicants increases the burden for adjudicators more than freedom of choice. The positive aspect of abundant alternatives may not function in certain decision contexts.

I have discussed some characteristics of adjudicators' justification of their own allocation, such as the abstract nature of philosophical principles which may be convenient for adjudicators to use in their justification. However, I do not mean that adjudicators always justify their allocation decision in a strategic way simply to increase its seeming legitimacy. There are indeed many cases in which fairness claims are strategically used to increase the seeming legitimacy of allocation decisions even though adjudicators know otherwise (e.g., Leventhal, 1976). Yet adjudicators often claim the fairness of their own allocation because they truly believe so. An adjudicator may be in fact motivated to be fair in making allocations but his or her allocation decision may not be fair due to the lack of skill, knowledge or ability. In the allocation situation of the present studies, as well as in many real situations, it is difficult to determine whether adjudicators' justification is a strategic rationalization or a true reflection of their belief. However, the present results do indicate possible discrepancies between adjudicators' actual decision making processes and their justifications whether or not the adjudicators acknowledge these discrepancies.

8.3 Adjudicator-observer differences in fairness judgments

The results of Study 1 and Study 2 indicate clear differences between adjudicators and observers in judging the fairness of the allocation decision. As mentioned in the previous section, adjudicators claim that their own allocation decision is fair because they consider that their distributive philosophies and procedures are fair. On the other hand, observers judge the fairness of the adjudicators' decision making mostly according to its outcomes (particularly when the resource is highly scarce) and the application items used in making decisions. These results suggest the importance of considering people's roles in allocations for understating the issues of fairness judgments.

Causal attribution research is concerned with the actor-observer differences. It has been found that people who observe others' actions commonly see the others' internal states (e.g., motivation, ability, knowledge, personality) as the source of their actions, while actors see themselves as acting according to environmental circumstances (Jones & Nisbett, 1971). The results of the present studies offer an example of such tendencies. It was found that adjudicators tend to attribute their omissions of deserving applicants to resource scarcity (external factor), whereas observers judge these omissions as the adjudicators' failure caused by improper values or misuse of decision criteria (internal factors). The attribution research suggests that the actor-observer differences can be reduced by providing an observer with more information about the situation in which an action occurs (Eisen, 1979). However, the present studies do not support this suggestion. Even when observers were provided the information about all of the adjudicators' allocation principles, procedures and outcomes, the determinants of overall fairness in observers' judgments were no more similar to those of adjudicators' than were they when observers knew only adjudicators' decision principles and outcomes or only their decision

procedures and outcomes.

In addition to the internal-external attribution, fairness judgments by observers and those by adjudicators can be contrasted as judgments based on concrete aspects of allocation decision making and judgments based on its abstract aspects. In judging the fairness of allocations, observers seem to focus on more concrete aspects of the allocation decision than do adjudicators. For example, both observers and adjudicators judged the overall fairness based on decision principles. However, observers focused on application items (concrete principles), whereas adjudicators focused on distributive philosophies (abstract principles). Nisbett, Borgida, Crandall, and Reed (1976) suggest that people often fail to integrate abstract information into their overall judgments. Abstract information may be difficult to use or irrelevant for observers in making their fairness judgments.

The other difference between observers and adjudicators was found in the relative influences of procedures and outcomes on the overall fairness judgments. The idea from procedural justice research -- the use of a fair procedure can increase the overall fairness of the decision -- was supported for adjudicators, but not for observers. The results of Study 2 show that observers' judgments of overall fairness are influenced more by decision outcomes than its procedures. Decision procedures may be more complex and more difficult for observers to perceive compared to the outcomes of allocations (Leventhal, Karuza, & Fry, 1980). In fact, the present results indicate only a little correspondence between adjudicators' actual decision process and observers' evaluations of adjudicators' procedures.

Observers reported more commission errors than omission errors. This result may be explained in terms of the saliency of these errors. When a resource is highly scarce, the number of accepted applicants is by definition much smaller than the number of rejected

applicants. Observers can find commission errors by examining the deservingness of only a few accepted applicants, but they must examine the larger number of rejected applicants to find omission errors. Thus, compared to omission errors, commission errors would be easier for observers to specify.

The results indicate, however, that omission errors are more predictive of observers' judgments of overall fairness than commission errors when resource scarcity is high. It was also found that observers judge the adjudicators' procedures less fair when rejections were cancelled less often in the case of high scarcity. These results suggest that the reduction of omission errors may be a large concern for observers' fairness judgment when a resource is highly scarce. Einhorn (1978) illustrates that it would be more difficult to reduce omission errors than commission errors when scarcity is high. If omission errors have more influence on observers' fairness judgment, and if this type of error is hard to reduce, then adjudicators' allocation is unlikely ever to be judged fair by observers in the case of high resource scarcity.

Observers in the present studies also engaged in the same allocation decision task as adjudicators - each subject played both roles. Due to this research design, at least two issues can be addressed. First, the fairness judgements by observers and by adjudicators can be contrasted as judgments about self-performance and judgments about other's performance. The results indicate that people often judge their own allocations are fairer than others' allocations. This tendency is consistent with self-serving bias found in causal attribution research (e.g., Bradley, 1978; Reiss, Rosenfeld, Melburg, & Tedeschi, 1981). However, the present results also indicate that people judge others' allocation as fairer than their own in some cases, suggesting that fairness judgments are not always strategic explanations to legitimate their own decisions.

Second, by requiring each subject to take the roles of observer and adjudicator, the research design can also provide insights about the effects of people's experiences on changing their values. In life, people sometimes do play both roles. One may think that people's experiences as adjudicators may reduce the adjudicator-observer differences in fairness judgments; "I understand adjudicators' circumstances because I have the same experience." If so, as people have more opportunities to take others' roles, their values or behaviors may become more homogeneous, or their tolerance may increase and conflicts may be reduced among individuals. However, the present studies warn of overestimating people's experiences in changing their fairness judgments. Despite their experiences as adjudicators, subjects' fairness judgments as observers were quite different from the judgments as adjudicators. Also, although observers often judged adjudicators' decision principles fairer when they agreed on principles, the adjudicator-observer similarities in decision procedures had little influence on observers' fairness judgments. Observers' fairness judgments may be independent of what they did as adjudicators (see Grab, 1989 about ineffectiveness of experiences on improving judgments). In general, these results indicate that roles people are taking in a given allocation situation would have stronger influence on the fairness judgments of the allocation than people's past experiences of the other roles.

8.4 Principles, procedures and outcomes of adjudicated allocations

Another major purpose of the present studies was to determine how important it is to differentiate three aspects of adjudicated allocations -- principles, procedures and outcomes -- for understanding the issues of fairness. The results indicate that people may judge the decision principles to be fair but its procedures unfair, or they may judge the procedures fair but not the outcomes, etc. (Greenberg & Cohen, 1982; Reis, 1986, 1987). That is, the fairness of these three aspects of allocation decision making can be judged independently

by people.

In addition, a certain allocation principle does not always result in the same outcomes. Many adjudicators' considered "allocating a resource according to applicants' needs" as the most important principle and considered the applicants' need-description as one of the most important application items. Adjudicators had identical information about applicants and they employed similar heuristics. Nevertheless, they often chose different applicants. Also, adjudicators disagreed about which application items reflected which philosophical principles. Yet disagreements about means does not necessarily lead to disagreements about ends. Some decision making studies (e.g., Bordley, 1985; Johnson & Payne, 1985; Thorngate, 1980) have shown that different decision heuristics may lead to the same outcome with quite high probability. Biggs, et al (1985), for example, found the high level of agreement among the bank officers' loan decision outcomes, despite of different strategies employed. There seems to be no simple relationship among principles, procedures and outcomes in allocation decisions. Therefore, it is important to consider the issues of fairness in allocations from each of the three perspectives.

8.5 Gender differences in fairness judgments

The present studies show several gender differences in the fairness judgments. First, male observers focus on decision outcomes or principles rather than its procedures in judging the overall fairness of adjudicators' allocation decision. In contrast, female observers are more concerned with decision procedures and report fewer decision errors in the adjudicators' allocation. This result may be generalized: males are more outcome oriented, females are more process oriented. The similar difference has been discussed in studies of achievement motivation; males tend to be concerned with the effect of solutions in looking at their achievement, whereas females focus more on the process of achieving (e.g., Veroff, 1973). For example, males would gain the sense of achievement from

solving a mathematical problem no matter how much time and energy they spend to reach the solution. Females would gain a sense of achievement from how hard they worked or how much they tried. It seems that this sex difference in outcome/process orientation can be extended to fairness judgments of adjudicated allocations.

Previous studies have found different preferences for distributive principles between males and females: males are more likely than females to allocate a resource according to the applicants' abilities or contributions (e.g., Leventhal, Popp, & Sawyer, 1973). Also, studies of moral development suggest that females are more often expected to consider needs of applicants than are males (e.g., Bernard, 1981). Eagly (1987) notes that the society expects different roles for males and females: women should be communal and men should be agentic. Because of the communal qualities that females are expected to embody, they are likely to be expected to care for the needs of others. By learning what society expects of them, females come to care more than males for others' needs. However, the present results show that both females and males consider the need principle most important, and that males consider the ability principle no more important than do females. As mentioned earlier, this result may be due to the strong value for humanitarianism in Canadian society. Alternatively, the different results between the present studies and the previous studies may be attributed to the different definitions of distributive principles. The importance of philosophies in the previous studies was an inference based on the allocation outcomes, whereas the importance of distributive philosophies in the present studies indicates subjects' moral ideal. Moral ideals for a fair allocation may not differ between males and females.

Despite their similarities in judging the importance of philosophical, abstract principles, males and females considered the importance of concrete principles differently;

more males considered the index of academic achievement (i.e., GPA) important, whereas more females considered applicants' need-description important. Also, males believed the applicants' GPA reflected ability, but females believed it reflected ability and accomplishment.

Kahn and Gaeddert (1985) review studies which found gender differences in allocation behavior. They summarize four possible positions to explain gender differences: males and females allocate differently because of 1) the difference in perception concerning what aspects of people are relevant to use in practising a universal principle (the equity principle in their discussion), 2) the difference in goals and motivations in interacting with people, 3) the difference in social expectations about the behavior toward males and females, and 4) the difference in social status associated to gender. The results of the present studies supports the first position. Males and females do not differ in their belief about important philosophical principles for a fair allocation, but they have different perspectives concerning what concrete criteria (relevant inputs) reflect the philosophical principles.

8.6 Implications for three fields of research

The present studies attempt to explore issues of fairness in adjudicated allocations by bridging gaps among three different research fields in psychology: human decision making, distributive justice and procedural justice. This attempt reveals how much each research field can benefit by empirical and theoretical knowledge in the other fields and provides new insights to each of the research fields. I would like to discuss some implications of the present thesis to human decision making research and distributive and procedural justice research in social psychology.

Research on human decision making began with the assumption that people choose alternatives that maximize utility. The rationality of human decision making has been

defined by this assumption, itself derived from classical economics. However, this economic assumption of rationality has often failed to account for people's decision behavior. Perhaps this is because humans are irrational. As an alternative possibility, however, decision making research has recently adopted a more cognitive psychological perspective, introducing the notion of mental costs and benefits in making decisions. It is assumed that anything required to make a decision, such as time and mental effort, is a cost for decision makers and that they invest their efforts only if the cost of efforts is balanced with the benefit from making a good decision (e.g., Beach & Mitchell, 1978). Because cognitive capacity is limited, humans are assumed to simplify the decision process by employing mental short cuts or heuristics, even though the quality of the decision is usually sacrificed to some degree (Hogan, 1975; Onken, Hastie, & Revelle, 1985). Based on these notions, decision behavior which was categorized as irrational according to the classical economic assumption becomes rational in terms of its adaptation to the decision environments (Einhorn & Hogarth, 1981); a decision is rational if it is made efficiently with minimum cost in a given decision situation (e.g., Johnson & Payne, 1985).

Decision making research has employed this behavioral perspective, supposedly improving the economic assumption of human nature. However, it is still assumed that an individual makes a decision in an economic way so that the decision satisfies his or her nature as a benefit-seeker by minimizing the cost and maximizing the benefit. That is, the concept of rationality in decision making research still implies that a decision maker is an economic agent and his or her only salient motive for making a good decision is the economic motive to maximize some form of utility. This is probably because decision research has developed closely related to business and marketing, or because this is the social ideal in North American society with the assumption about humans' self-interest, egoistic nature (Batson, 1990; Sampson, 1977). As Elster (1979) argues, "if an

explanation for a given behavior can be found invoking only self-interest ... , this is always preferable in principle to explanations invoking concern for others" (p. 142).

Most human decision making studies have paid little attention to the possible variety of motives for making a good decision (cf. Kuhlman & Marshello, 1975; van Lange, Liebrand, & Kuhlman, 1990). Rational decision making can be derived from a motive other than its egoistic, economic maximization or its efficiency. Elster (1979) concludes that "altruism, trust, and solidarity are genuine phenomena that cannot be dissolved into ultra-subtle forms of self-interest. This argument ... points to the need for a broad notion of rationality" (p. 146). It is difficult to imagine that adjudicators attempt to be fair in order to maximize their own economic utility. Consideration of issues of fairness in allocation decisions reminds us that a rational human being can be moved by concerns for others. Human decision making research should pay more attention to the existence of different fundamental motives for making a good decision.

The second implication of the present studies for decision making research is concerned with the function of information. In general, information is assumed to have a value or utility itself because it reduces uncertainty in making a decision (Ritchie, 1991). In order for a piece of information to reduce uncertainty, the quality of information should be a concern (e.g., Keller & Staelin, 1987). For example, in the selection of the applicants for a graduate school, a goal of the decision is to choose students who will succeed in the program. The GPA of applicants may be one kind of information which is believed to be correlated with their general academic abilities and then with success in the graduate school. Thus, the information about GPA is considered important and useful in making decisions by reducing the uncertainty of the students' possibility of their success. That is, good information is often defined by its predictability of how each alternative meets the goal of

the decision.

However, in the allocation decision situation, some kinds of information may be correlated with, and thus predictive of, the allocation goal, but for fairness should not be used. To be fair, the main function of information -- to reduce uncertainty -- may sometimes not be the first concern. For example, social class of the students may be correlated with their academic abilities because of the opportunity of education or because of their parents' attitudes towards education, etc. However, it may be unethical to consider the information about students' social class in selecting students, and the decision may be judged unfair if such information is used for the selection process. As seen in observers' comments in the present studies, there are some kinds of information which should not be examined (e.g., sex, marital status, etc). Many social issues concern how not to use certain information such as sex, ethnic origin, sexual orientation, etc. The availability of information is generally considered desirable. However, issues of fairness of allocation decisions should call more attention of decision making researchers to different aspects of information use, such as ethical issues, beyond efficiency in reducing uncertainty.

A third implication of the present studies for human decision making research is concerned with methodological issues. I employed the Information Display Board (IDB), a popular method in decision making research. This method could provide new insights about the nature of human decision processes which may affect the fairness of allocations. The IDB method has limitations. For example, the method cannot provide the data about people's internal processing of information; subjects may be using some information for their judgments, but may not be re-examining it if they memorized it before, (see Billings & Marsus, 1983; Payne, 1980). In spite of such shortcomings, however, the present studies show the richness of information in the data collected by the IDB method. Most of the studies using the IDB method have examined only the amount of information examined and

the relative employment of the item-by-item and the alternative-by-alternative examination (see Ford, Schmitt, Schechtman, Hults, & Doherty, 1989); they have not made best use of the data. Almost no analyses have been conducted on the selectivity of the information, the frequency and flexibility of making decisions, inter-judge consistency, etc. Although some researchers have addressed neglected research questions which could be answered with the IDB method (e.g., Ford, et al., 1989), their concerns has been only with exploring new independent variables. Few concerns have been addressed about the measurements which can be extracted from the IDB data. The present studies illustrate many other possible analyses of the IDB data.

Psychological studies of social justice began by the efforts for the identification of different distributive principles and their dominance in allocating resources (e.g., Adams, 1965; Deutsch, 1975; Homans, 1961). Later, researchers recognized another aspect in social justice in addition to the distributive philosophies: procedural fairness in social justice. Because Thibaut and Walker (1975) began to investigate procedural justice in the context of legal systems, the application of the concept of procedural justice to resource allocations was delayed. The importance of procedural fairness has been increasingly recognized and procedural justice is now studied with distributive justice in resource allocation research (e.g., Barrett-Howard & Tyler, 1986; Leventhal, 1980; Leventhal, Karuza, & Fry, 1980). Yet, at least four issues should be considered for further research.

First, there is little distinction between allocation principles and allocation outcomes; the fairness of these two aspects are collectively conceptualized as distributive justice. Most researchers assume a straightforward relation between an allocation principle and its outcomes, underestimating the role and complexity of allocation procedures (Lind & Tyler, 1986). Beliefs about justice may be consist and clear, but their application to the practical

circumstances of people's lives is often confused and ambivalent (Reis, 1987). Fairness research has not realized the possible errors occurring during the decision making process. An adjudicator may be motivated to be fair, but may fail to do so. Justice motives and allocation behavior should be separated (Reis, 1986).

Second, although the concept of procedures has been increasingly employed in studies of resource allocations, the definitions of the procedures has ignored important aspects of decision making process. In the early works of procedural justice in court settings, procedures have been clearly defined by the opportunities for people other than judges to express their opinions (i.e., process control and decision control). However, in the context of resource allocations, the concept of procedures is somewhat vague. Decision making research can offer one definition of procedures, namely, the pattern of information examination and its integration into a final decision.

One may argue that the decision making process is not the only aspect of procedures involved in resource allocations. Particularly because the fairness of allocation is considered in social and political contexts, there are many other procedural aspects, such as the selection of adjudicators, the collection of applicants' information, the representativeness of basic concerns and values of any subgroup affected by the allocation, etc. (Leventhal, 1980). The decision making process that converts a given set of information into a decision is only one of the several aspects of allocation procedures. However, decision making process itself consists of various steps, and the present studies indicate many present dangers for decreasing the fairness of allocations. For example, there is an underlying assumption that the quality of decision can be increased simply by having accurate and sufficient information (e.g., Leventhal, 1980). As indicated in the present studies, however, having a large set of information is one thing, examining it is another, and using it properly is something else again. Decision outcomes may vary even

when the identical set of information is examined and the identical heuristic is used. These aspects have been ignored in the studies of procedural justice in resource allocations.

Third, many studies of distributive justice have employed only a particular allocation situation, that is, an allocation of rewards between two parties (or occasionally among three or four) based on their contributions. This tendency in part stemmed from the theoretical background of distributive justice research in social psychology (Cohen, 1979). The early studies of distributive justice, based on equity theory, (e.g., Adams, 1965; Homans, 1961) drew researchers' attention away from many other possible allocation situations involving 1) different kinds of resources other than rewards, 2) multiple applicants, and 3) multiple cues to describe the applicants. Equity theory defines that a reward is allocated between two parties proportionally to their inputs (i.e., contributions). First, rewards are by definition things given in return for contributions. This definition of rewards may increase the validity of the equity theory. However, such rewards are only one of many possible resources to be allocated in a society. Second, the comparison procedure defined in the equity theory becomes exponentially complex as the number of applicants as well as the kinds of inputs increase. Comparisons among multiple applicants based on multiple inputs require complex decision processes, such as selective examination of information, trade-off of positive and negative aspects of applicants, etc. These processes need closer examination.

The function of fairness of allocations is for the survival of the society which ensures well-being of individual members. The more satisfied the individuals are, the better their society functions and vice versa. Social justice aims at a positive and circular relation between the well-being of individuals in a society and the well-functioning of their society (Deutsch, 1975) beyond the reciprocative relations between two parties. Many allocations in society involve a resource other than rewards such as welfare and educations among

more than two applicants based on many different kinds of information. Research on the fairness of allocations should not ignore these situations simply to continue a research paradigm or tradition.

Finally, the present studies employed a situation called adjudicated allocation to investigate people's allocation decision making and their fairness judgments. This particular allocation situation serves as a useful research setting because it isolates motives for a fair allocation from allocators' self-interests in obtaining resources. Recently, some social psychologists have been concerned about confusions of the concepts of justice and fairness in allocations with the other concepts such as satisfaction with outcomes, equity, and self-interests (e.g., Cohen, 1979; Messick & Sentis, 1983; Reis, 1978; Sampson, 1981). These various psychological factors may exist in the allocation situation, but the applicants' self-interest in obtaining resource or adjudicators' satisfaction with their own decision procedures cannot be considered as motives for a fair allocation.

Distributive justice is often sought as a moral ideal. Among many fields in social sciences which are concerned with the issues of social justice, the tasks of a moral philosophy of social justice is to provide an argument of the priority of a set of principles to assess the distribution of resources among applicants. On the other hand, the task of social psychology should be to investigate the antecedents and consequences of people's endorsement of such principles (Cohen, 1979). In social psychology, the justice of allocations should be considered in terms of people's perception and belief of rightness or fairness in allocations. At the same time, individuals' perception of fairness and their endorsement should be treated as a product of interactions among these individuals in society.

Although individuals' belief and perception about fair allocations is a result of social interactions, it is probably impossible for everyone in a society to agree on a single allocation rule, in part because of different positions of individuals and different situational factors, as indicated by the present studies. When motives for a fair allocation are considered universal across all individuals in society, we would overlook the negotiated quality of the issues of the fairness (Sampson, 1981). Instead, we should pay attention to the interactions among individuals in different social positions with different values and belief as well as their efforts to reach some agreement or compromise on what will be perceived, believed and accepted as fair allocations.

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of/de

3

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

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Appendix A:
An Example
Of
A Student Loan Application

1. **Sex:** Female
2. **Birth Date:** 25/06/68
3. **Marital Status:** Single
4. **GPA(%) High School:** 78
5. **Full/Part Time in the Program:** Full time
6. **Description of Studies:** Psychology - 3rd Honors. Studying psychology with interests in deviant behavior and activities. Developmental psychology is an interest (Aging and at the other extreme children)
7. **Plans for Future:** Graduate work on psychology is a possibility. Teacher's college is another. Hope to teach primary children or work with criminals.
8. **GPA(%) Last Year:** 64
9. **Extracurricular Activities:** Photography, soft ball coach
10. **Latest Employment:** Direct Film - Sales / Part-time
11. **Gross Salary (per week):** \$100
12. **Self-evaluation - Academic Achievement:** Average
13. **Self-evaluation - Seriousness of Purpose:** Very Good
14. **Income (Last Year) from Summer Employment:** \$5000
15. **Income (Last Year) from Part-time Employment While Studying:** \$1500
16. **Income (Last Year) from Contributions from Parents/Spouse:** None
17. **Investments:** Saving \$2000. T-Bill matures \$1000
18. **Total Net Income as Reported on Last Year's Tax Return:** \$6500
19. **Estimated Study Expenses (Tuition, Books, etc.):** \$2300
20. **Estimated Living Expenses:** \$3100
21. **Description of Need:** My parents are both retired and summer employment paid for living expenses during summer. A part-time job during the school year does not generate enough money to live on. My parents should not have to pay for 2 children to go to university and cannot. Post secondary education is an important step for my future, and thus financial aid will permit me to move forward towards career.

Appendix B:
Computer Program
For
Study 1

FOR STUDENT LOAN STUDY 1

'Written by Miho Hotta

'For MSBasic

'This program displays a set of student loan application forms to a subject on the screen.

'The subject can examine as much or little applicant information as he or she wants in any order as he or she wishes. Also, decisions (accepting or rejecting applicant) can be made at any time, and the decisions can be changed.

'The trajectory of the subject's decision process is stored in a data file.

'The data format is (item, applicant, decision, duration).

BREAK OFF

WINDOW 1,"CHOICES",(2,40)-(509,338),5:CLS

DEFINT A-Z

DIM CH(20),REC(1000,3),QUES\$(25),ANS\$(25,20),A\$(20)

DIM Q(3):Q(0)=88:Q(1)=8:Q(2)=100:Q(3)=260

DIM A(3):A(0)=102:A(1)=8:A(2)=200:A(3)=260

CALL TEXTFONT(4, CALL TEXTSIZE(9)

TR=0:R=0:C=0

GOSUB Readdata:' Read data of applicant information from data files

GOSUB Display

I=1:J=1:Z=0:PQ=1:PA=1:' (I=Item, J=applicant)

' (Z=-1= request, Z=1=decision, 'Z=0=choice)

GOSUB Showchoice

Loop:

B\$=INKEY\$

IF B\$="" THEN Loop

IF B\$="Q" OR B\$="q" THEN GOSUB Quit

GOSUB What:GOTO Loop

What:

B=ASC(B\$)

X=CH(J):IF X=B THEN RETURN:' ignore pushing twice for decisions

Play:

FINISH!=TIMER:IF Z<>0 THEN REC(TR,3)=FINISH!-START!

Z=0:MORE=0:SELECT CASE B

CASE 13:' RETURN KEY (request of info)

Z=-1

START!=TIMER

CASE 42:' * key = re-consider

Z=1:CH(J)=B

IF X=43 THEN NACC=NACC-1

IF X=45 THEN NREJ=NREJ-1

CASE 43:' + key = accept

Z=1:IF NACC=NWIN THEN MORE=1' If more applicants are accepted, not recorded.

```

    IF NACC<NWIN THEN NACC=NACC+1:CH(J)=B:IF X=45 THEN NREJ=NREJ-1
CASE 45:' - key = reject
    Z=1:NREJ=NREJ+1:CH(J)=B:IF X=43 THEN NACC=NACC-1
CASE 30:' 4 = left arrow for selecting applicant
    I=I-1:IF I<1 THEN I=NQUE
CASE 31:' 6 = right arrow for selecting applicant
    I=I+1:IF I>NQUE THEN I=1
CASE 28:' 8 = up arrow for selecting item
    J=J-1:IF J<1 THEN J=NAPP
CASE 29:' 2 = down arrow for selecting item
    J=J+1:IF J>NAPP THEN J=1
CASE ELSE
END SELECT
IF Z<>0 AND MORE=0 THEN TR=TR+1:REC(TR,0)=I:REC(TR,1)=J:REC(TR,2)=B
GOSUB Showchoice
GOSUB Decision
RETURN

```

Showchoice: ' for display of information of the applicant on the item

```

IF Z=0 THEN
    QS=CHR$(64+J)+"s "+QUES(I)+":":TEXTBOX QS,Q(0),0:TEXTBOX "",A(0),0
    LOCATE 5,11+2*PQ:PRINT " ";:LOCATE 5,11+2*J:PRINT "•":PQ=J
    LOCATE PA+6,46:PRINT " ";:LOCATE I+6,46:PRINT "•":PA=I
END IF
IF Z=-1 THEN TEXTBOX ANS$(I,J),A(0),0
RETURN

```

Decision: ' for decision made by the subject

```

IF Z=1 THEN
    BEEP:IF CH(J)=42 THEN H=32 ELSE H=CH(J)
    LOCATE 7,11+2*J:PRINT CHR$(H);
    CALL TEXTFACE(I):LOCATE 3,10:PRINT NACC::CALL TEXTFACE(0)
END IF
RETURN

```

Readdata: ' read applicant information from data file

```

STIMULIS=FILES$(1,"TEXT"):OPEN "I",1,STIMULIS,32000
INPUT# 1,NQUE,NAPP,NWIN,TLIMIT:#Questions, #Applicants, #Accept, Time
FOR I=1 TO NQUE:' read questions from file
    LINE INPUT# 1,QUES(I)
NEXT
FOR J=1 TO NAPP
    LINE INPUT# 1,AS(J):'read a name
    FOR I=1 TO NQUE
        LINE INPUT# 1,ANS$(I,J):' read an answer
    NEXT
NEXT

```



```

NEXT
CLOSE 1
PERSON$=FILE$(0,"Subject"):OPEN "O",1,PERSON$
PRINT# 1,DATE$;" person: ";PERSON$;" saw: ";STIMULIS
PRINT# 1,"below: Question,Applicant,Judgement, Time"
RETURN

```

Display: ' for display on the screen

```

LINE (6,100)-(262,210),1,B
LOCATE 1,1:PRINT "# awards:":PRINT "to give = ";NWIN:PRINT " given = 0";
CALL TEXTFACE(1)
LOCATE 1,20:PRINT " * key = reconsider";TAB(40);"L & R arrows = applicants"
LOCATE 2,20:PRINT " + key = accept";TAB(40);"U & D arrows = questions"
LOCATE 3,20:PRINT " - key = reject";TAB(40);"Return key = answers"
LINE (1,40)-(510,40),1: CALL TEXTFACE(0)
AP$=LEFT$(" A B C D E F G H I J K L M N O P Q R S T ",2*NAPP)
LOCATE 6,1:PRINT "Applicants: ";AP$;TAB(48);"Questions:"
PRINT "Decision: ";
FOR I=1 TO NQUE:LOCATE 6+I,48:PRINT QUE$(I);:NEXT I
LOCATE 24,2:PRINT "Type ";:CALL TEXTFACE(1):PRINT""Q"";
CALL TEXTFACE(0):PRINT " when you complete your decisions"
START!=TIMER
RETURN

```

Quit:

```

FINISH!=TIMER:REC(TR,3)=FINISH!-START!
'LOCATE 10,1:PRINT: FOR T=1 TO TR:FOR K=0 TO 3: PRINT REC(T,K);:
NEXT:PRINT:NEXT
FOR T=TR TO 1 STEP -1
    IF REC(T,2)<>13 THEN REC(T,3)=REC(T,3)-REC(T-1,3)
NEXT
'LOCATE 10,1:PRINT: FOR T=1 TO TR:FOR K=0 TO 3: PRINT REC(T,K);:
NEXT:PRINT:NEXT
CALL TEXTFACE(1):LOCATE 21,1:BEEP:BEEP:PRINT "Please call the experimenter"
FOR T=1 TO TR:FOR K=0 TO 3:PRINT# 1, REC(T,K):NEXT:NEXT
CLOSE
INPUT "",A
END
RETURN

```

Appendix C:

Informed Consent Form

Informed Consent Form

I, _____ agree to participate in a student loans study conducted by Miho Hotta under the supervision of Dr. Thorngate. I understand that this study consists of two sessions. The procedure for this project has been fully explained to me.

I also understand that I may withdraw from the experiment at any time and that the results and my identity will be kept in strict confidence.

Name (PRINT): _____

Signature: _____ Date: ____/____/____

Witness: _____ Date: ____/____/____

Appendix D:
Pre-decision Questionnaire
In
Study 1

Before you start examining the information of applicants, I would like to ask you some questions concerning judgment principles and information items in the loan decisions.

1. JUDGMENT PRINCIPLES

Below is a list of five judgment principles people often report using to decide who will receive student loans. Please circle the number you think best reflects how important each principle is in making your loan decisions.

Principle 1 according to an applicant's needs

-3 -2 -1 0 +1 +2 +3

Not important at all Neutral Very important

Principle 2 according to an applicant's abilities

-3 -2 -1 0 +1 +2 +3

Not important at all Neutral Very important

Principle 3 according to an applicant's efforts

-3 -2 -1 0 +1 +2 +3

Not important at all Neutral Very important

Principle 4 according to an applicant's accomplishments

-3 -2 -1 0 +1 +2 +3

Not important at all Neutral Very important

Principle 5 according to an applicant's attributes, such as leadership and maturity

-3 -2 -1 0 +1 +2 +3

Not important at all Neutral Very important

2. INFORMATION ITEMS IN APPLICATIONS

Below is a list of the 21 information items used in the application forms you will examine. In the blank spaces below them, please list the five items you think are most important in making your loan decisions, using the numbers of the items. Please make sure that your most important item appears on the first line, your second most important on the second line, and so forth.

1. Sex
2. Birth Date
3. Marital Status
4. GPA(%) High School
5. Full/Part Time in the Program
6. Description of Studies
7. Plans for Future
8. GPA(%) Last Year
9. Extracurricular Activities
10. Latest Employment (Institution & Job), Full/Part time
11. Gross Salary (per week)
12. Self-evaluation - Academic Achievement
13. Self-evaluation - Seriousness of Purpose
14. Income (Last Year) from Summer Employment
15. Income (Last Year) from Part-time employment while studying
16. Income (Last Year) from Contributions from Parents/Spouse
17. Investments
18. Total Net Income as Reported on Last Years' Tax Return?
19. Estimated Study Expenses (Tuition, Books, etc.)
20. Estimated Living Expenses
21. Description of Need

Most important: _____

Second most important: _____

Third most important: _____

Fourth most important: _____

Fifth most important: _____

Appendix E:
Post-decision Questionnaire
In
Study 1

QUESTIONNAIRE

Thank you very much for your cooperation. Now I would like to ask you some questions concerning the decisions you have made. Please circle the number you think best reflects what you think.

1. Do you think that there were enough loans for qualified applicants?

-3 -2 -1 0 +1 +2 +3

Not enough at all

Enough

More than enough

2. Do you think that the number of applicants was too large to examine?

-3 -2 -1 0 +1 +2 +3

Too small

Neutral

Too large

3. How confident are you that, overall, your loan decisions were fair?

-3 -2 -1 0 +1 +2 +3

Not confident at all

Neutral

Very confident

4. Do you think that the procedures you used in making loan decisions were fair?

-3 -2 -1 0 +1 +2 +3

Very unfair

Neutral

Very fair

5. Did you give a loan to any applicant(s) you feel did NOT deserve one?

Yes No (Circle One)

If Yes, which applicants do you feel did NOT deserve a loan? Indicate the applicant numbers here: _____

Yes No (Circle One)

Very fair

Very fair

10. Approximately, what percentage of the available applicant information (i.e., 21 items x 8 applicants = 168 pieces of information) do you think you examined ?

_____ %

11. Do you think that you examined enough information to make your loan decisions?

-3 -2 -1 0 +1 +2 +3

Not enough at all

Enough

More than enough

12. Do you think that you spent enough time to make your loan decisions?

-3 -2 -1 0 +1 +2 +3

Not enough at all

Enough

More than enough

13. Do you think that you examined the applicant information in systematic way?

-3 -2 -1 0 +1 +2 +3

Not systematic at all

Neutral

Very systematic

Please continue to the next page.

14. Below is a list of five judgment principles. After you made decision, please re-evaluate the importance of each principle. Please circle the number you think best reflects how important each principle is in making your loan decisions.

Principle 1 according to an applicant's needs

-3 -2 -1 0 +1 +2 +3
Not important at all Neutral Very important

Principle 2 according to an applicant's abilities

-3 -2 -1 0 +1 +2 +3
Not important at all Neutral Very important

Principle 3 according to an applicant's efforts

-3 -2 -1 0 +1 +2 +3
Not important at all Neutral Very important

Principle 4 according to an applicant's accomplishments

-3 -2 -1 0 +1 +2 +3
Not important at all Neutral Very important

Principle 5 according to an applicant's attributes, such as leadership and maturity

-3 -2 -1 0 +1 +2 +3
Not important at all Neutral Very important

15. Following page is a list of the 21 information items used in the application forms you examined. After you made decisions, please re-list the five items you think are most important in making your loan decisions, using the numbers of the items.

1. Sex
2. Birth Date
3. Marital Status
4. GPA(%) High School
5. Full/Part Time in the Program
6. Description of Studies
7. Plans for Future
8. GPA(%) Last Year
9. Extracurricular Activities
10. Latest Employment (Institution & Job), Full/Part time
11. Gross Salary (per week)
12. Self-evaluation - Academic Achievement
13. Self-evaluation - Seriousness of Purpose
14. Income (Last Year) from Summer Employment
15. Income (Last Year) from Part-time Employment While Studying
16. Income (Last Year) from Contributions from Parents/Spouse
17. Investments
18. Total Net Income as Reported on Last Years' Tax Return?
19. Estimated Study Expenses (Tuition, Books, etc.)
20. Estimated Living Expenses
21. Description of Need

Most important: _____

Second most important: _____

Third most important: _____

Fourth most important: _____

Fifth most important: _____

Please make sure of the time and the date of your next session.

Thank you very much again.

Experimenter,
Miho Hotta

Appendix F:
Written Debriefing
In
Study 1

Thank you very much for your participation. There was no deception in this study. As I mentioned at the beginning of this session, the purpose of this study is to examine decision making processes in allocating resources, in this particular case, selecting students for loans. Mainly, I wish to examine how people integrate information of applicants, what kinds of strategies they employ in making a decision, and how these decision making processes are related to fairness judgement. I will give you more explanation about the whole study, including Session 2, after your participation in the next session.

As I mentioned earlier, all the inputs you have made with this computer terminal were recorded in a data file for analyses. Also, data will be used for Session 2. The data will be kept in strict confidence.

I will contact you again to confirm the date and time of your next session. If you want to change the date and/or time of your next session, please let me know as soon as possible. You can contact me at 788 - 4027.

Thank you very much again.

Experimenter,

Miho Hotta

Appendix G:
An Example
Of
A Trajectory Of Decision Making

A's Sex = Female
 A's Birth Date = 06/68
 A's Marital Status = Single
 A's GPA(%) in High School = 78
 A's Full/Part Time in the Program = Full-time
 A's Description of Studies = Studying psychology with interests in deviant behavior and activities. Developmental psychology is an interest (Aging and at the other extreme children)
 A's Plans for Future = Graduate work on psychology is a possibility. Teacher's college is another. Hope to teach primary children or work with criminals.
 A's Extracurricular Activities = Photography Soft ball coach
 A's Latest Employment = Direct Film - Sales/ Part-time -- 9/88-present
 A's Gross Salary (per week) = \$100
 A's Self evaluation-Academic Achievement = Very good
 A's Self evaluation-Seriousness of Purpose = Average
 A's Income(Last Yr)/Summer Employment = \$5000
 A's Income(Last Yr)/While Studying = \$1500
 A's Income(Last Yr)/Contributions/Parents = None
 A's Investments = Saving \$2000. T-Bill matures \$1000
 A's Total Net Income/Last Yr's Tax Return = \$6500
 A's Estimated Study Expenses = \$3300
 A's Estimated Living Expenses = \$3100
 A's Estimated Study Expenses = \$3300
 A's Total Net Income/Last Yr's Tax Return = \$6500
 B's Total Net Income/Last Yr's Tax Return = \$20000
 B's Estimated Study Expenses = \$2220
 B's Total Net Income/Last Yr's Tax Return = \$20000
 B's Estimated Living Expenses = \$5000
 B's Sex = Female
 B's Birth Date = 13/02/53
 B's Marital Status = Single
 B's GPA(%) in High School = 65
 B's Full/Part Time in the Program = Full-time
 B's Description of Studies = Psychology
 B's Plans for Future = My intent is to complete my degree and then begin a career in staff management of public relations.
 B's Extracurricular Activities = Swimming. Fitness. Skiing. Camping. Hiking.
 B's Gross Salary (per week) = \$285
 B's Income(Last Yr)/Summer Employment = \$4500
 B's Income(Last Yr)/While Studying = \$3500
 B's Income(Last Yr)/Contributions/Parents = \$2000
 B's Investments = Bonds \$15000. RRSP \$2000
 B's Total Net Income/Last Yr's Tax Return = \$20000
 Here, rejected B
 C's Total Net Income/Last Yr's Tax Return = \$7822.35
 C's Sex = Female
 C's Birth Date = 21/10/68
 C's Marital Status = Single
 C's Extracurricular Activities = Music (Piano Guitar Singing). Swimming. Biking.

Reading.

C's Gross Salary (per week) = \$400

C's Income(Last Yr)/Contributions/Parents = None

C's Income(Last Yr)/While Studying = None

C's Income(Last Yr)/Summer Employment = \$8200

Here, rejected C

C's Total Net Income/Last Yr's Tax Return = \$7822.35

D's Total Net Income/Last Yr's Tax Return = \$8164

D's Investments = Bonds \$2000

D's Income(Last Yr)/Contributions/Parents = None

D's Income(Last Yr)/While Studying = \$1500

D's Income(Last Yr)/Summer Employment = \$5000

D's Sex = Male

D's Birth Date = 11/09/67

D's Marital Status = Single

D's GPA(%) in High School = 65

D's Full/Part Time in the Program = Full-time

D's Plans for Future = Work for Labor Vehicle Manufactory for a year. Self employment (small business)

D's Extracurricular Activities = Commerce Society

D's Gross Salary (per week) = \$300

D's Self evaluation-Academic Achievement = Very good

D's GPA(%) in High School = 65

D's GPA(%) of the last year = 70

D's Self evaluation-Seriousness of Purpose = Very good

D's Income(Last Yr)/Contributions/Parents = None

D's Total Net Income/Last Yr's Tax Return = \$8164

D's Estimated Study Expenses = \$2550

D's Estimated Living Expenses = \$6000

D's Description of Need = Because I do not wish to borrow from my parents. I have not asked them for anything but bridge financing, i.e., loan in Feb until summer.

Here, rejected D

E's Description of Need = I need financial assistance because our income is for living expenses. I am serious about my education for a career, and would not just "blow" the money on inappropriate things. I request assistance for my academic expenses, not personal living expenses. It's a shame to see so many students getting assistance using the money for a good time.

E's Sex = Female

E's Birth Date = 4/05/65

E's Marital Status = Married

E's GPA(%) in High School = 79

E's Plans for Future = I would like to deal with community psychology particular in a children's rehabilitation type of settings. I am planning to continue for a masters and achieve the career objects.

E's Gross Salary (per week) = \$125

E's Self evaluation-Academic Achievement = Very good

E's Self evaluation-Seriousness of Purpose = Average

E's Income(Last Yr)/Summer Employment = \$3000

E's Income(Last Yr)/While Studying = \$4500

E's Income(Last Yr)/Contributions/Parents = \$33000

E's Investments = Building lot \$26500

Here, rejected E

F's Investments = Property \$289000. Saving 13000

F's Total Net Income/Last Yr's Tax Return = \$35000

F's Estimated Study Expenses = \$2269

F's Estimated Living Expenses = \$10000

F's Description of Need = I am applying for financial assistance because my parents decided not to continue their support to my education.

F's Sex = Female

F's Birth Date = 23/04/65

F's Marital Status = Single

F's GPA(%) in High School = 75

F's Full/Part Time in the Program = Full-time

F's Description of Studies = Main interest is sociology

F's Plans for Future = Not planned

F's GPA(%) of the last year = 71

F's Extracurricular Activities = Gymnastics (1 year). Track & Field (11 years).

F's Latest Employment = Victor temporary Service - Temp. works in different office/Part-time -- 4/89-8/89

F's Gross Salary (per week) = \$140

F's Self evaluation-Academic Achievement = Very good

F's Self evaluation-Seriousness of Purpose = Excellent

F's Income(Last Yr)/Summer Employment = \$900

F's Income(Last Yr)/While Studying = None

F's Income(Last Yr)/Contributions/Parents = \$9800

F's Investments = Property \$289000. Saving 13000

Here, rejected F

Here, canceled the rejection of E

E's Investments = Building lot \$26500

Here, canceled the rejection of D

Here, canceled the rejection of C

Here, canceled the rejection of B

G's Investments = Bond \$400. Stocks \$1000

G's Sex = Male

G's Birth Date = 08/03/68

G's Marital Status = Single

G's GPA(%) in High School = 75

G's Full/Part Time in the Program = Full-time

G's Description of Studies = Low or psychology. I am planning to finish in April having 16 hours of classes a week.

G's Plans for Future = I hope to join the RCMP as a career.

G's GPA(%) of the last year = 65

G's Extracurricular Activities = Swimming. Cycling

G's Latest Employment = A+A Bricklaying - Bricklayer/Full-time -- 5/89-9/89

G's Gross Salary (per week) = \$500

G's Self evaluation-Academic Achievement = Average

G's Self evaluation-Seriousness of Purpose = Excellent

G's Income(Last Yr)/Summer Employment = \$8000

G's Income(Last Yr)/While Studying = None

G's Income(Last Yr)/Contributions/Parents = None

G's Investments = Bond \$400. Stocks \$1000
 H's Investments = Saving \$950. GIC \$2500
 H's Income(Last Yr)/Contributions/Parents = \$2200
 H's Income(Last Yr)/While Studying = \$1200
 H's Income(Last Yr)/Summer Employment = \$3900
 H's Estimated Study Expenses = \$2167
 H's Estimated Living Expenses = \$3794
 H's Estimated Study Expenses = \$2167

Here, rejected H

H's Extracurricular Activities = Cycling Jogging Music
 H's Latest Employment = Drug Store - Supervisor/Part-time -- 9/89-present
 H's Description of Studies = Interested in criminology -- Legal rights. Court process
 H's Full/Part Time in the Program = Full-time
 F's Full/Part Time in the Program = Full-time
 B's Full/Part Time in the Program = Full-time
 A's Full/Part Time in the Program = Full-time
 C's Full/Part Time in the Program = Full-time
 D's Full/Part Time in the Program = Full-time
 E's Full/Part Time in the Program = Full-time
 F's Full/Part Time in the Program = Full-time
 G's Full/Part Time in the Program = Full-time
 H's Full/Part Time in the Program = Full-time
 A's Full/Part Time in the Program = Full-time

A's Sex = Female

A's Birth Date = 06/68

B's Birth Date = 13/02/63

C's Birth Date = 21/10/68

Here, rejected B

C's Birth Date = 21/10/68

D's Birth Date = 11/09/67

E's Birth Date = 4/05/65

Here, rejected E

F's Birth Date = 23/04/65

G's Birth Date = 08/03/68

H's Birth Date = 27/04/68

H's Income(Last Yr)/Summer Employment = \$3900

H's Income(Last Yr)/While Studying = \$1200

H's Income(Last Yr)/Summer Employment = \$3900

H's Income(Last Yr)/While Studying = \$1200

H's Income(Last Yr)/Contributions/Parents = \$2200

H's Description of Need = Because my GIC's are tied up for the next 12 months, I am
 unable to use this for my education. My parents will not contribute to my education,
 therefore I will be short approximately \$2500 which I can pay back with GIC's.

H's Investments = Saving \$950. GIC \$2500

Here, canceled the rejection of H

Here, accepted H

H's Income(Last Yr)/While Studying = \$1200

H's Income(Last Yr)/Summer Employment = \$3900

H's Self evaluation-Seriousness of Purpose = Very good

H's Self evaluation-Academic Achievement = Average

H's Gross Salary (per week) = \$100

H's Latest Employment = Drug Store - Supervisor/Part-time -- 9/89-present

H's Extracurricular Activities = Cycling Jogging Music

H's GPA(%) of the last year = 68

H's Plans for Future = I would like to eventually get in to police work

H's Full/Part Time in the Program = Full-time

H's GPA(%) in High School = 69

H's Marital Status = Single

H's Birth Date = 27/04/68

H's Marital Status = Single

H's Sex = Female

G's Description of Need = I need money because I have a Very expensive girlfriend, my rent is \$400 a month plus utilities and the gas prices take alot of money to run my sports car.

G's Sex = Male

G's Birth Date = 08/03/68

G's Marital Status = Single

G's GPA(%) in High School = 75

G's Full/Part Time in the Program = Full-time

G's Description of Studies = Low or psychology. I am planning to finish in April having 16 hours of classes a week.

G's Plans for Future = I hope to join the RCMP as a career.

G's GPA(%) of the last year = 65

G's Extracurricular Activities = Swimming. Cycling

G's Latest Employment = A+A Bricklaying - Bricklayer/Full-time -- 5/89-9/89

G's Gross Salary (per week) = \$500

G's Self evaluation-Academic Achievement = Average

G's Self evaluation-Seriousness of Purpose = Excellent

G's Income(Last Yr)/Summer Employment = \$8000

G's Income(Last Yr)/While Studying = None

G's Income(Last Yr)/Contributions/Parents = None

G's Investments = Bond \$400. Stocks \$1000

G's Estimated Study Expenses = \$2400

G's Estimated Living Expenses = \$7000

Here, rejected G

F's Description of Need = I am applying for financial assistance because my parents decided not to continue their support to my education.

F's Sex = Female

F's Birth Date = 23/04/65

E's Description of Need = I need financial assistance because our income is for living expenses. I am serious about my education for a career, and would not just "blow" the money on inappropriate things. I request assistance for my academic expenses, not personal living expenses. It's a shame to see so many students getting assistance using the money for a good time.

D's Description of Need = Because I do not wish to borrow from my parents. I have not asked them for anything but bridge financing, i.e., loan in Feb until summer.

Here, rejected D

C's Description of Need = I am not receiving any help from my parents. Because I lived in Ottawa, my expenses for the summer were such that it was difficult to save a lot of money, and my gross income is about 2000 when taxes etc. are removed. I cannot afford to work

and continue to maintain an A+ average. Estimates of living expenses are likely underestimates.

C's Estimated Living Expenses = \$5049

C's Sex = Female

C's Birth Date = 21/10/68

C's Marital Status = Single

C's GPA(%) in High School = 96

C's Full/Part Time in the Program = Full-time

C's GPA(%) in High School = 96

C's Full/Part Time in the Program = Full-time

C's Description of Studies = Major is psychology. Presently doing social problems, addictions, thesis of two independent studies which are on sleep and dreams.

C's Extracurricular Activities = Music (Piano Guitar Singing). Swimming. Biking. Reading.

C's Latest Employment = Carleton University - Research Assistant/Full-time -- 5/89-9/89

C's Gross Salary (per week) = \$400

C's Self evaluation-Academic Achievement = Excellent

C's Self evaluation-Seriousness of Purpose = Excellent

C's Income(Last Yr)/Summer Employment = \$8200

C's Income(Last Yr)/While Studying = None

C's Income(Last Yr)/Contributions/Parents = None

C's Investments = Saving \$2000

C's Total Net Income/Last Yr's Tax Return = \$7822.35

C's Estimated Study Expenses = \$2338

C's Estimated Living Expenses = \$5049

Here, rejected C

A's Sex = Female

A's Birth Date = 06/68

A's Marital Status = Single

A's Extracurricular Activities = Photography Soft ball coach

A's Gross Salary (per week) = \$100

A's Income(Last Yr)/Summer Employment = \$5000

A's Income(Last Yr)/While Studying = \$1500

A's Income(Last Yr)/Contributions/Parents = None

A's Investments = Saving \$2000. T-Bill matures \$1000

A's Total Net Income/Last Yr's Tax Return = \$6500

A's Estimated Study Expenses = \$3300

A's Estimated Living Expenses = \$3100

A's Estimated Study Expenses = \$3300

A's Total Net Income/Last Yr's Tax Return = \$6500

A's Investments = Saving \$2000. T-Bill matures \$1000

A's Income(Last Yr)/Contributions/Parents = None

A's Income(Last Yr)/While Studying = \$1500

A's Income(Last Yr)/Summer Employment = \$5000

H's Income(Last Yr)/Summer Employment = \$3900

H's Income(Last Yr)/While Studying = \$1200

H's Income(Last Yr)/Contributions/Parents = \$2200

H's Investments = Saving \$950. GIC \$2500

A's Investments = Saving \$2000. T-Bill matures \$1000

A's Total Net Income/Last Yr's Tax Return = \$6500

B's Total Net Income/Last Yr's Tax Return = \$20000
 A's Total Net Income/Last Yr's Tax Return = \$6500
 C's Total Net Income/Last Yr's Tax Return = \$7822.35
 D's Total Net Income/Last Yr's Tax Return = \$8164
 E's Total Net Income/Last Yr's Tax Return = \$10235.10
 F's Total Net Income/Last Yr's Tax Return = \$35000
 G's Total Net Income/Last Yr's Tax Return = \$10000
 H's Total Net Income/Last Yr's Tax Return = \$4900
 A's Total Net Income/Last Yr's Tax Return = \$6500
 A's Income(Last Yr)/While Studying = \$1500
 A's Income(Last Yr)/Summer Employment = \$5000
 A's Income(Last Yr)/Contributions/Parents = None
 A's Plans for Future = Graduate work on psychology is a possibility. Teacher's college is another. Hope to teach primary children or work with criminals.
 A's Marital Status = Single
 A's Birth Date = 06/68
 A's Sex = Female
 A's Description of Need = My parents are both retired. Summer employment paid for living expenses during summer, and A part-time job during the school year does not generate enough money. My parents should not pay for 2 children to go to university and cannot. Post secondary education is an important step for my future; financial aid will permit me to move forward towards career.
 H's Description of Need = Because my GIC's are tied up for the next 12 months, I am unable to use this for my education. My parents will not contribute to my education, therefore I will be short approximately \$2500 which I can pay back with GIC's.
 H's Plans for Future = I would like to eventually get in to police work
 Here, canceled the acceptance of H
 Here, rejected H
 Here, accepted A
 B's Investments = Bonds \$15000. RRSP \$2000
 C's Investments = Saving \$2000
 D's Investments = Bonds \$2000
 E's Investments = Building lot \$26500
 F's Investments = Property \$289000. Saving 13000

Outcome of Decision

Applicant A is finally accepted.

Appendix H:
Computer Program
For
Study 2

FOR STUDENT LOAN STUDY 2

'Written by Miho Hotta

'For MSBasic

'This program display a trajectory of decision process done by another subject which is
'stored in a data file.

'An subject can control the speed of display to observe the decision processes.

'By pressing RETURN key, the subject can see the next info. examination.

'After running the program, a subject file, and then an application information (cond.)file
'must be selected

BREAK OFF

WINDOW 1,"CHOICES",(2,40)-(509,338),5:CLS

DEFINT A-Z

DIM CH(20),REC(1000,3),QUES\$(25),ANS\$(25,20),A\$(20)

DIM Q(3):Q(0)=88:Q(1)=8:Q(2)=100:Q(3)=260

DIM A(3):A(0)=102:A(1)=8:A(2)=200:A(3)=260

CALL TEXTFONT(4):CALL TEXTSIZE(9)

GOSUB File:' Read procedural data

GOSUB Readdata:' Read data of application from files

GOSUB Display

I=1:J=1:Z=0:PQ=1:PA=1:' (I:que, J:app, Z=-1: request, Z=1:decision, Z=0:choice)

R=0:C=0:NACC=0:NREJ=0

LOCATE 24,1:PRINT "Start ?"

CALL TEXTFACE(1):INPUT "Press Return-key",A:CALL TEXTFACE(0)

GOSUB Playback

END

Playback:

LOCATE 7,13:PRINT STRING\$(2*NAPP," "):' clear the deck

FOR J=1 TO NAPP:CH(J)=32:NEXT J

FOR T=1 TO TR

 I=REC(T,0):J=REC(T,1):B=REC(T,2):TIME=REC(T,3)

 GOSUB Play

 LOCATE 24,1:INPUT "Next ";A

 CALL TEXTFACE(1):LOCATE 22,1:PRINT "

"::CALL

TEXTFACE(0)

NEXT T

LOCATE 24,1:PRINT STRING\$(25," ")

CALL TEXTFACE(1):BEEP:BEEP:BEEP:PRINT "This is the end of playback."

INPUT "Please start the evaluation",A:CALL TEXTFACE(0)

RETURN

Play:

```

X=CH(J):Z=0:SELECT CASE B
CASE 13:' RETURN KEY (request of info)
    Z=-1
    START!=TIMER
CASE 42:' * key
    Z=1:CH(J)=B
    IF X=43 THEN NACC=NACC-1
    IF X=45 THEN NREJ=NREJ-1
CASE 43:' + key
    Z=1:IF NACC<NWIN THEN NACC=NACC+1:CH(J)=B:IF X=45 THEN
NREJ=NREJ-1
CASE 45:' - key
    Z=1:NREJ=NREJ+1:CH(J)=B:IF X=43 THEN NACC=NACC-1
CASE ELSE
END SELECT
IF Z=1 THEN GOSUB Decision
GOSUB Showchoice
RETURN

```

Showchoice:

```

QS=CHR$(64+J)+"s "+QUE$(I)+":":TEXTBOX QS,Q(0),0:TEXTBOX "",A(0),0
LOCATE 5,11+2*PQ:PRINT " ";;LOCATE 5,11+2*J:PRINT " ";;PQ=J
LOCATE PA+6,46:PRINT " ";;LOCATE I+6,46:PRINT " ";;PA=I
IF Z=-1 THEN TEXTBOX ANS$(I,J),A(0),0
RETURN

```

Decision:

```

BEEP
FLAG=0
IF CH(J)=42 THEN H=32 ELSE H=CH(J)
LOCATE 7,11+2*J:PRINT CHR$(H);
CALL TEXTFACE(1):LOCATE 3,10:PRINT NACC;;CALL TEXTFACE(0)
CALL TEXTFACE(1):LOCATE 22,12
IF CH(J)=43 THEN PRINT "Accepted"
IF CH(J)=45 THEN PRINT "Rejected"
IF CH(J)=42 THEN PRINT "Cancelled"
CALL TEXTFACE(0)
IF I=REC(T-1,0) AND J=REC(T-1,1) THEN FLAG=1
IF FLAG=1 AND REC(T-1,2)=13 THEN Z=-1
RETURN

```

File:

```

TR=0:STIMULIS=FILE$(1,"TEXT")
OPEN "I",2,STIMULIS
LINE INPUT#2, A$:LINE INPUT#2,B$
WHILE NOT EOF(2)
    TR=TR+1
    FOR K=0 TO 3: INPUT #2, REC(TR,K):NEXT
WEND
CLOSE 2
RETURN

```

```

Readdata:
STIMULIS=FILE$(1,"TEXT")
OPEN "I",1,STIMULIS,32000
INPUT# 1,NQUE,NAPP,NWIN,TLIMIT:'#Questions, #Applicants, #Accept, Time
FOR I=1 TO NQUE:' read questions from file
    LINE INPUT# 1,QUE$(I)
NEXT
FOR J=1 TO NAPP
    LINE INPUT# 1,A$(J)'READ a NAME
    FOR I=1 TO NQUE
        LINE INPUT# 1,ANS$(I,J):' read an answer
    NEXT I,J
CLOSE 1
RETURN

```

```

Display:
LINE (6,100)-(262,210),1,B
LOCATE 1,1:PRINT "# awards:":PRINT "to give = ";NWIN:PRINT " given = 0";
CALL TEXTFACE(1)
LOCATE 1,20:PRINT " * key = reconsider";TAB(40);"L & R arrows = applicants"
LOCATE 2,20:PRINT " + key = accept";TAB(40);"U & D arrows = questions"
LOCATE 3,20:PRINT " - key = reject";TAB(40);"Return key = answers"
LINE (1,40)-(510,40),1: CALL TEXTFACE(0)
AP$=LEFT$(" A B C D E F G H I J K L M N O P Q R S T ",2*NAPP)
LOCATE 6,1:PRINT "Applicants: ";AP$:TAB(48);"Questions:"
PRINT "Decision: ";
FOR I=1 TO NQUE:LOCATE 6+I,48:PRINT QUE$(I);:NEXT I
RETURN

```

Appendix I:

Evaluation Sheet

For

The Principles And Procedures Condition

In Study 2

If Yes, which applicants do you feel DID deserve a loan? Indicate the applicant numbers here:

-3 -2 -1 0 +1 +2 +3

Very fair

-3 -2 -1 0 +1 +2 +3

More than enough

-3 -2 -1 0 +1 +2 +3

Very systematic

Please call the experimenter.

Miho Hotta

Appendix J:

Evaluation Sheet

For

The Principles Only Condition

In Study 2

If Yes, which applicants do you feel did NOT deserve a loan? Indicate the applicant numbers here: _____

5. Do you think that the judge did NOT give a loan to any applicant(s) who DID deserve one?

Yes No (Circle One)

If Yes, which applicants do you feel DID deserve a loan? Indicate the applicant numbers here: _____

6. If you have any comments about the judge's loan decisions, please describe.

Thank you very much.

Please call the experimenter.

Experimenter,

Miho Hotta

Appendix K:

Evaluation Sheet

For

The Procedures Only Condition

In Study 2

If Yes, which applicants do you feel DID deserve a loan? Indicate the applicant numbers here: _____

5. Do you think that the judge examined enough information to make the loan decisions?

-3 -2 -1 0 +1 +2 +3

Not enough at all

Enough

More than enough

6. Do you think that the judge examined the applicant information in systematic way?

-3 -2 -1 0 +1 +2 +3

Not systematic at all

Neutral

Very systematic

7. If you have any comments about the judge's loan decisions, please describe.

Thank you very much.

Please call the experimenter.

Experimenter,

Miho Hotta

Appendix L:
Written Debriefing
In
Study 2

Thank you very much for your participation. As well as the first session, there was no deception in this session. The purpose of the first session was to examine decision making processes in allocating resources, in this particular study, selecting students for limited number of loans. Particular emphases of the analyses will be placed on how much and which kinds of information people examine in making decisions and how their ways of examining the information are related to their fairness perception.

The purpose of this second session is to examine how allocation decision making would be judged its fairness. As you examined the other person's decision making, the other person examined decisions you made in the last session. This was done to examine the influence of the similarity in making decisions between two persons on their judgment of fairness. Also, I wish to examine how the different types of information about the other person's allocation influence fairness judgment. I have three conditions, in which subjects are given different information about the other person's decision making in order to judge its fairness. In one condition, subjects are given information about the other person's principles in selecting students for loans (e.g., Abilities of the students are important) by reviewing the other person's answers in the questionnaire. In the second condition, subjects are given information about the other person's procedures to examine application information by observing his/her decision making processes on the computer screen. In the third condition, subjects are given both information. In all condition, subjects are told outcomes of the other person's decision (i.e., which students were accepted for the loans). In social psychological research about how people judge the fairness of decisions, there is an argument that, in judging the fairness, outcomes of the decisions, (i.e., who receives how much) or principles of the decisions(e.g., need-principle, ability-principle) are less important than the procedures (i.e., how the decision was made). For example, people who judge the other person's decision may finally select different students for loans from those the other person did. If the argument I mentioned above is correct, people judge the other person's decision as fair if they agree with his/her procedures, even though they disagree with the outcomes. The degree of the influence of procedural information on fairness judgement is the main concern of this second session, although there are some other.

All the data, such as fairness ratings or evaluation of the other person's allocation you have completed, will be kept in strict confidence. If you are interested in the result or anything about these studies, I would be happy to let you know. You can contact me in this office or you can phone me at 788-4027.

Thank you very much again. I wish you a good term!!

Experimenter, Miho Hotta

Appendix M:

Observers' Comments

On

Adjudicators' Decision Making

Comments by male observers

Principles and Procedures condition

- *It seemed as though they were quick on the draw and did not compare enough applicants ahead to for a thorough decision
- *The judge returned to sex frequently. The judge also repeated 4 applicants because of sex
- *Bases everything on marks, not the future or actual individualism of the person. Gave loan to person with no idea about his future.
- *The judge repeatedly looked at lots of important information. The judge seemed to second guess a lot of decisions to reject applicants
- *Overall, the judge examined the applicants very systematically and examined the necessary material, but the decisions made by the judge were not very accurate.
- *He seemed to check everyone's sex and birth date at least once, which I do not think are too important (maybe he was just curious).
- *I think that the judge in this case could have narrowed his/her methods of examination. I felt that much depended on sex and GPA's for respective applicants.
- *The judge was very indecisive early but then made all decisions eliminating most every candidate in very short order following his second roving of the candidates.
- *I do not know whether it is a good idea to give a loan to a pregnant woman, if only due to the fact that she will be out of school for a certain period of time. Checking the sex of the applicants would have set up a bias against the males in the survey.
- *I think s/he was very systematic and went about it in a very good way but unfortunately made the wrong choices.
- *The judge could have spent more time on the relevant (important) information and possible look at all the applicants' information.
- *The judge seemed to make decisions early and fill them in later, not comparing items as closely as possible.
- *For applicant M (chosen by the judge), her hours working at the Bay should be checked. If someone earns 25 hours/week that is a fair sum of money plus any summer earnings should make her ineligible for a loan. A, M, N (chosen by the judge) are not deserving because of no achievement, earning, present working
- *Applicant E (chosen by the judge) is married with house that can be mortgaged and husband may be working with large income. Applicant H's (chosen by the judge) parents have given money in past, if the child is in such need the parents will give again until GIC's are available.

Principles Only condition

- *I feel that the judge looked too much at the applicant's person and not the applicants'

- financial situation. When you look at money, it is important to see how it is handled.
- *Everyone has different opinions as to what the five most important information items are or should be, yet the judge's most important and second most important items can be and almost always will be exaggerated, therefore this should not be considered first and foremost.
 - *The only problem with the applicant chosen was that it appeared as if who used her A+ average as an excuse to avoid working. Many students do both. Why cannot this applicant? She also made a lot of money in the summer and has a high paying weekly job.
 - *Based on the criteria, that his judge felt that was important her decisions were fair and just.
 - *Choosing F was unjust. F's total tax return was 35,000 of which savings were 13,000. For a single person living expenses to be 10,000 this is too much as well the parents contributed 9,800, this was the only unjust picking because from the looks of it, F had sufficient funding for university year.
 - *I agree with the judge's decision to award a loan to candidate N but I disagree with the awarding a loan to candidate M over candidate C. Both M and C are in roughly the same position financially after taxes; about a \$1,000 deficit for the coming school year. The difference in these two candidates is that C's GPA is 25% higher than M's- a 90% GPA is truly phenomenal at the university level. This GPA reflects very hard work and I believe that C deserves the loan more than M because obviously she has worked for it. The judge's decision are based strictly on financial data and should take into consideration grades, plans for future studies, etc.
 - * In making the loan decision, the judge took into consideration of applicant N's sex, which is unfair to other deserving applicants of the other sex.
 - *I think that overall the judge's decisions (C & K) were fair but I think that there were more deserving applicants such as N.
 - *I think that the judge should have placed more emphasis on the applicants' accomplishments and efforts. I also think that estimated living and study expenses are a weak basis to place a decision on.
 - *The judge chose applicant C and the applicant is making \$400/week and C's summer income was pretty high. I thought K should have been chosen because she had a large family, her salary and summer income was pretty low.
 - *If the judge gives loans on a basis of who deserves them, controversy may arise. Most of the students deserve the loans, but there is a limited availability and the greatest need among the applicants must be determined which can be difficult (especially when looking for the proper element to form a basis for decision making).

Procedures Only condition

- *One should not take sex or age as a consideration.

- *The judge seemed to place some emphasis on GPA and self-evaluation, which I feel should not, in any way, determine the outcome.
- *The person's judgment process was very similar to my own.
- *Examined irrelevant information, i.e., marital status. Did not examine all information before making a decision
- *I am curious about the temporary choice of F, who seems able to support herself and school easily.
- *N (chosen by the judge) is not in a position, and will not be in the near future, to repay the loan or spare the time and handle or account for the coming up in the near future.
- *S/he kept checking the sex of the applicants, which does not matter. S/he kept checking income tax, which is very misleading.
- *Should have looked at all the applicants before he went on to make decisions.
- *Applicant I (chosen by the judge) had a \$125,000 investment and subsequently did not need a loan. The judge's procedures improved after about the first 1/3 of the process.
- *I believe this judge and I used two different criteria for deciding. I chose on a basis of the applicants' ability to pay back loan, whereas this judge based her/his decisions on need.
- *The judge seemed to put a fair emphasis on sex and age which is unfair.

Comments by female observers

Principles and Procedures condition

- *Based great deal of importance on academic achievement (GPA)
- *Description of need also played a vital role along with income earned/gross salary plus living expenses. If there had been two loans available, I also believe that applicant A (chosen by the judge) was equally deserving.
- *After 'emphasizing' the importance of income for a loan decision, the judge appears to have overlooked this while making his/her decision.
- *I think the judge examined enough information. However, I feel the choice of D to be inappropriate because the person's reason is because he does not want to borrow money from his parents. But there are others who do not have people to borrow money from.
- *Quite consistent with my own patterns
- *S/he jumped from one applicant to another looking at different items and hardly comparing at all. S/he looked at specific things for one, but not others. (ex. description of need).

Principles Only condition

- *I think the description of need is very important and helps distinguish clues about the persons' personality and sincerity. This applicant's attitudes towards other students says that university life is completely work. The money should not be used for only food times, but university should be more than just work. This applicant does not seem to feel

this way. Most students requesting assistance are in need of financial assistance, therefore less likely to "blow" it on their social life. I agree, however, that applicant E should receive a loan.

- *I think that this judge made a fair decision with regards to the applicant although the reasons seemed to be not all that important. I find that the information items should have been looked at closer.
- *I think money from a loan should be given to someone with financial need! The fact that they had a high GPA (in high school) to have wonderful persons for the future. Or even that they participated in extracurricular activities has no bearing on their need for a loan. The loan should be given to those who need some financial assistance (no matter what faculty of study they are in). Whereas a person's living expenses, study expenses and description of need, cross-referenced with their summer income shows some level of financial stability: producing a level of need for financial assistance. Finally if a person is married, with children, and perhaps a single parent, they will obviously have more need for the money (loan) than someone who played sports in high school, had high GPA has big serious dreams for the future with (perhaps complete financial backing from his/her parents.
- *I cannot understand why 5 (Full/part time) and 10 (Latest employment) as important items. Neither why H was chosen.
- *Choosing C was a fairly good decision. Yet choosing D was not. According to information given D is still able to receive funds from his parents whereas other applicants are not able to or will not.
- *I believe they rated GPA too high. I think description of needs is more important.
- *I think that it was difficult to choose two people from 16, because at least half of them really need a loan to continue their study. But I want to tell that I liked this experiment and think it was interesting.
- *I think the judge looked at the external factors more, for example, O (chosen by the judge) comes from a family of 13 children and N (chosen by the judge) is expecting a baby.
- *Focusing on the description of studies is not important because most students change their majors. Self-evaluation is not that important, most people want to look good on the applications. GPA for last year is good but should be at the end of the list.

Procedures Only condition

- *This person should have looked at all the information given because s/he missed some important information about these people. But the decision was good because it was my second choice but I was afraid that she might be a risk and not be able to pay it back and that she might be able to get OSAP.
- *The judge's decision was fair. It was my second choice but its is very difficult to choose only one.
- *I believe the judge used a very logical, systematic and fair decision making process.

- *The judge's decision was very fair. They looked at all the information possible and then went back to make a decision, which as a good one.**
- *I thought that the judge was very fair in deciding who would get a loan and s/he seemed to pick out 2 of the people who needed the money the most.**
- *The use of GPA in high school as a decision factor is not a good indication of loan acceptance. Most of the applicants did not have their criteria fully examined, a decision was based purely on one possibly two factors, which I believe is wrong. I believe M (chosen by self) is better than P (chosen by the judge) because this individual is more responsible and hard-working, just because P's parents do not send money to her is not enough to justify need of a loan. 1) first considered applicant by GPA 2) then description of need, 3) total net income, 4) GPA in high school really has nothing to do with loan. Systematic but not orderly, in that basis on one reason only, all of individuals' data not evaluated. Then after choices made seemed to re-check answers in an erratic way with no purpose really.**
- *I feel there were other applicants that were more deserving of the loan.**
- *I do not think that s/he should have rejected loans right way after looking at their self evaluation. It is not fair.**
- *I felt all loan decisions were deserving although I did not feel H (chosen by the judge) deserved the loan because she chose to put her money in GIC's instead of using it toward her education.**

END

22.12.92

FIN