

## Chapter 2

# Fairness Ideals, Hidden Selfishness, and Opportunistic Behavior: An Experimental Approach

**Abstract** Economic experiments have shown that human incentives are not limited to the profit-maximizing principle but also motivated by fairness. Such studies presuppose that individuals commit to fixed value systems and that experimental institutions invoke fairness ideals. By performing a distributive experiment followed by production, this research shows that participants strategically select fairness ideals that are advantageous to themselves in terms of self-distribution. Participants whose relative earnings exceed those of their partners in their assigned experimental pairs adhere to a liberalist fairness ideal, whereas those whose relative earnings are lower than their partners prefer an egalitarian distribution of money. This reflects that individuals behave opportunistically as a result of resolving a cognitive dissonance between material utility and fairness.

**Keywords** Fairness ideals • Cognitive dissonance • Hidden selfishness • Opportunistic behavior

## 2.1 Introduction

Studies involving economic experiments such as the dictator game, or the ultimatum game, which require participants to distribute a fixed amount of money among various participants, have shown that human incentives are not limited to the profit-maximizing principle but also include other ethical values such as reciprocity, consideration for others, or ideals of fairness (Kahneman et al. 1986; Forsythe et al. 1994; Levine 1998; Fehr and Schmidt 1999). Those studies show that limited numbers of participants conform to the *homo economicus* prediction; in most experiments, less than one-third of participants distributed all the money to themselves, while the remainder left money for distribution to the partners they were paired with.

Some studies performed experiments consisting of distribution and production stages, which were revisions of dictator games. Those studies are interesting in that they enable experimenters to observe how the experimental settings of a production stage affect subjects' decisions or fairness ideals in a subsequent distribution stage and how subjects have varied fairness ideals. For instance, experiments by Hoffman and Spitzer (1985) and Cappelen et al. (2007) showed that participants'

decision-making is influenced by various fairness ideals such as egalitarianism, liberalism, or utilitarianism. According to their studies, a strictly egalitarian participant would divide team income 50:50 with the partner they were paired with, whereas a strictly liberal participant would base the distribution on the earnings of each team member during the production process. Liberal egalitarians distribute team earnings according to the amounts each team member could control and thus take responsibility for (e.g., investment amount) and do not consider amounts that depend on chance (e.g., lottery winnings). Finally, a strict utilitarian would distribute the entire sum to themselves and leave nothing for the partners they were paired with.

Basically, the studies mentioned above presuppose that (1) each individual first commits to a certain *fixed value system* and (2) an *experimental institution* invokes a certain fairness ideal as a distribution principle, according to which individuals distribute money to those they are paired with.<sup>1</sup> Here it is presumed that, under a certain type of experimental institution (e.g., game rules, environments, payment procedures), a certain participant will *always* commit to a specific fairness ideal such as an egalitarian distribution. In that sense, subjects' fairness ideals are fundamentalist forms that remain constant under the same experimental settings.

Because it is presupposed that experimental institutions trigger fairness ideals in each subject, previous studies attempted to examine which factors definitively influence a participant's commitments to fairness ideals. This was done by changing the experimental institution and comparing the results with those where the institution is unchanged. For instance, Hoffman and Spitzer (1985) states that a participant tends to justify a larger distribution to themselves if a production method satisfactorily reflects their own ability and efforts. Experiments by Cherry et al. (2002) revealed that when anonymity is maintained, and when participants earn money through their own ability and effort (measured by GMAT score), most of them (more than 90 %) distribute all the money to themselves and leave nothing to their partners. However, questions arise as to whether individuals always follow a given value system in a fundamentalist way under a given experimental institution. Specifically, an important question is whether any wiggle room exists in which individuals can balance different fairness ideals or self-interests in a given situation.

By performing a distribution experiment involving production, this paper aims to show that some individuals tend to pursue opportunistic behavior, specifically the strategic selection of more advantageous distribution principles from among a range of possible options (i.e., opportunity sets) under constant experimental settings. Williamson (1975) suggests that individuals commit to opportunism, which does not follow an established or coherent ethical standard, but rather exploits opportunities inherent in a given transaction process. Opportunists do not deviate from social norms or rules (social reputation can be an important incentive), but are strategic

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<sup>1</sup>Hoffman and Spitzer (1985) states that participants "would concur with a particular concept of fairness in distribution" before the experiments and that a participant "perceives the experimental institutions as triggering a particular aspect of his concept of justice" and then "implements his perceptions of a fair distribution" (p. 260).

and try to exploit opportunities in given social situations—a behavior that can be described as “self-interest seeking with guile” (p. 26).<sup>2</sup> Williamson proposed the term opportunism to explain the emergence of transaction costs in external markets, and his work was derived from empirical investigations based on observations of enterprises that focus on transactions, contracts, and hierarchical controls. The behavioral presuppositions of opportunism given by Williamson are very intrinsic, but should be confirmed through concrete observation of individual behaviors.

According to the experimental results of this paper, a significant number of participants whose relative earnings are lower than those of their partners tend to commit to an egalitarian distribution, while participants with higher relative earnings than their partners tend to commit to a liberalist distribution. This tendency comes from subjects’ opportunistic way of committing to specific fairness ideals that result in a better distribution to themselves: for example, an egalitarian distribution brings higher income to participants with lower relative earnings, and vice versa, while a liberalist distribution brings higher income to participants with higher relative earnings. These experimental results imply that participants recognized two possible distributional opportunities, based on egalitarian and liberalist fairness ideals, respectively, and strategically “select” that which is more advantageous to themselves. Through such opportunism, subjects simultaneously satisfy both the “social norm” and their “self-interest.”

The structure of this paper is as follows: I first explain the concept of opportunism and its theoretical connotations as given by Williamson (Sect. 2.2). Then in the next section (Sect. 2.3), I explain the experiment design. In Sect. 2.4, I first analyze previous models and clarify their premises; then, I present the hypothesis and predictions of this research. After reporting on the experimental results in Sect. 2.5, I discuss the opportunistic behavior and cognitive dissonance in the experimental results in Sect. 2.6. Finally, I present conclusions in Sect. 2.7.

## 2.2 Opportunism and Its Theoretical Connotations

Williamson (1985) introduced the concept of opportunism to explain transaction costs in external markets, as well as why enterprises developed internal markets and hierarchical regulations. For him, the existence of opportunism combined with bounded rationality explained why transactions in external markets are sometimes more inefficient than those in internal markets or organizations. Let me suppose a case involving an auto company trying to conclude a consignment contract with a part manufacturer to produce a specific car part. Because the part manufacturer has more information on part production than does the auto company, and because

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<sup>2</sup>Williamson (1975) approaches the concept from a theoretical perspective, explaining the internal market in terms of transaction costs and opportunistic behaviors. However, this paper does not go into detail on this point.

the number of manufacturers that can produce the part is limited, the contract is likely to set transaction costs. In this situation, the part manufacturer may propose high part prices, decrease quality to reduce costs, or seek advantage through a contract that delays contract delivery. William called these cheating behaviors by the part manufacturer opportunistic behaviors, defined as “self-interest seeking with guile.” These opportunistic behaviors become possible because the auto company cannot know the most appropriate completion price or time because of limited information and moreover lacks options in terms of consigning production to other manufacturers in the limited part production market. Restated, the part manufacturer uses available “opportunities” to create a situation advantageous to itself.

By presupposing opportunism as well as bounded rationality,<sup>3</sup> Williamson develops theories relating to transaction costs and the development of internal markets. According to Williamson, because of the existence of transaction costs, which exist because of opportunistic behaviors like cheating by part manufacturers and the bounded rationality of enterprises, transactions in external markets become more uncertain and risky. Enterprises thus tend to develop internal markets and shift those contracts to internal organizations with hierarchical regulations that involve less uncertainty. For instance, an auto company may establish a part manufacturing division through the acquisition of a part manufacturer to stabilize the production process and reduce its cost relative to external consignment. Although Williamson successfully explained opportunistic behaviors as purposive action to achieve an objective under given social situations and their institutional outcomes, he does not satisfactorily explain why individuals or companies behave opportunistically. One may complement Williamson’s ideas regarding opportunistic behaviors by inquiring into individuals’ motivations and their behavioral mechanisms.

Opportunistic behaviors may be complementarily explained based on individuals’ psychological levels, as dialectic solutions to the problem of balancing different individual incentives: self-interest oriented and social norm oriented. Obviously, individuals seek to pursue their interests based on their self-preservation instincts, but we also observe that most individuals conform to the social norms of the society or organization they inhabit. According to Commons (1934), because interdependencies among people have increased in modern social systems, “working rules” that prevail in “going concerns” include various kinds of organizations or institutions, such as markets, enterprises, nations, families, and so on, and have become increasingly important to individual decision-making or behaviors. For instance, a market transaction process involves a set of rules or business customs that are broadly accepted by participants. Most participants in market transactions follow those “working rules” to avoid being removed from the transaction process in the market relevant to their interests. Thus, we can say that individuals have norm-oriented incentives, namely, tendencies to follow working rules that regulate the transaction process as well as self-interest-oriented incentives.

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<sup>3</sup>This behavioral assumption is originally proposed by Simon (1991).

Based on these two directions of individual incentives, one may explain the psychological mechanisms of an opportunistic behavior: as discussed above, these two orientations may superficially appear to involve conformance to social norms on the one hand, while on the other they seek to satisfy self-interest on a fundamental level. If one recalls the case of the part manufacturer, it becomes hard to accuse the manufacturer of cheating behaviors because superficially it does not deviate from social norms or market rules. Simultaneously though, the manufacturer is maximizing their self-interest under the limitations imposed by social rules. One may characterize opportunism as involving dual orientations of social norms and self-interest at the motivational levels.

## 2.3 Experimental Design

To examine the opportunistic behaviors discussed above, I modified the experiments of Cappelen et al. (2007). In the experiments, participants were asked to play a one-shot game involving both production and distribution. During the game, each participant was randomly matched with a partner to form teams of two players. Participants knew that they each had another team member, but the experiment was designed such that no participants, including the experimenter, were aware of the identity of their partners both during and after the experiment. The details of the game are as follows:

*Production Stage* In the production stage, participants were asked to earn a certain amount of points, and the total income earned by team members during this stage formed the team earnings. Each participant was given an initial endowment of 300 points. Participants were asked to invest their endowment in units of 100 points (i.e., they could invest 0, 100, 200, or 300 points). Points not invested were counted in a final payoff to the relevant participant. After deciding the investment amount, each participant automatically obtained a lotto number from a computer program, which attributed “2” with a probability of 50 % and a “4” with a probability of 50 %. Each income event at this production stage was counted by multiplying each investment amount by the lotto result. If a participant invested  $a_1$  ( $\in [0, 100, 200, 300]$ ) and derives a lottery win  $q_1$  ( $\in [2, 4]$ ), their production earning was  $\pi_1 = a_1 q_1$  ( $0 \leq \pi \leq 1200$ ). If the partner with whom a participant was paired invested  $a_2$ , derived a lotto win of  $q_2$ , and received production earnings  $\pi_2 = a_2 q_2$ , then the team’s combined income became  $\Pi = \pi_1 + \pi_2$  ( $0 \leq \Pi \leq 2400$ ).

*Distribution Stage* In the distribution stage, a participant was asked to furnish a distribution proposal that separated total team income into two shares, one for each individual in the pair. After the production stage, each participant was informed of the relevant figures on the screen: his investment  $a_1$ , his lottery result  $q_1$ , his earnings  $\pi_1 = a_1 q_1$ , the investment of his partner  $a_2$ , the lottery result of his partner  $q_2$ , the earnings of his partner  $\pi_2 = a_2 q_2$ , and the earnings of the team  $\Pi = \pi_1 + \pi_2$ . Then, as in the dictator game, the participant was asked for a distribution proposal

that divided the team's earnings between himself and his partner. After the proposals were given, one of the proposals offered by each member was randomly selected for implementation, and each individual's final profit was decided accordingly.

*Payment* The total points of the individual's distributed final profit were added to a non-invested endowment that was converted based on 1 point = 1 yen (100 yen is approximately \$1) and paid to each participant after the experiment.

## 2.4 Models, Hypotheses, and Predictions

In this section, I wish to explain the hypothesis of this chapter by summarizing the premises that form the basis of previous models on decision-making regarding distribution. I first describe the five premises of models from previous experimental studies regarding individuals' decision-making and then explain my hypothesis for this research.

### 2.4.1 Previous Models and Premises

To explain the results of distribution experiments such as the dictator or ultimatum games, Fehr and Schmidt (1999) developed a model of value function, consisting of individuals' utility function and social utility function. In those experiments, subjects were asked to distribute a given amount of money (e.g., \$10) with their team members. Most distribution experiments saw many subjects share the available pies with the partners in their pairs equally instead of taking the maximum possible for themselves, contradicting classical utilitarian predictions. Thus, they regarded individuals as having a tendency to avert inequality and as having negative utility owing to a deviation from equal distribution. The model of Fehr and Schmidt (1999) presupposes that individuals try to maximize their value function, consisting of utility function and social utility function, by deciding the amount  $y_i$  to be distributed to themselves in the distribution process. That is, individuals decide distribution amounts for themselves and their colleagues to satisfy their material utility as well as their social utilities according to their model.

In their model, a function of the social utility of an individual  $i$  is expressed as a negative function of deviating from an egalitarian distribution where team income is split equally among team members. A social utility function is expressed as

$$S_i = -\lambda_s \left( y_i - \frac{\Pi}{n} \right)^2 \quad (0 \leq \lambda_s, 0 \leq y_i \leq \Pi),$$

where  $\Pi$  denotes total team income,  $\lambda_s$  denotes the loading factor for the social utility, and  $n$  denotes the number of team members. In a case involving two team

members ( $n = 2$ ) and where \$10 is the total amount available for distribution, denoted as  $\Pi$ , the ideal amount to be distributed to each team member should be \$5 ( $= \frac{\Pi}{2}$ ). In this case, if I distribute \$7 ( $y_i = 7$ ) to myself, it must yield negative utility of  $-\lambda_s (5 - 7)^2$  by deviating from the ideal distribution under egalitarianism. In this case, the optimal solution for maximizing  $S_i$  is to follow ideal egalitarianism in determining the appropriate distribution to oneself: ( $y_i = \frac{\Pi}{2} = 5$ ). Thus, we can derive the following premise:

*Premise 1:* Individuals hold a social utility function, which is expressed as negative utility in accordance with its deviation from a certain ideal social norm.<sup>4</sup>

According to the model of Fehr and Schmidt (1999), individuals try to maximize their value functions consisting of a utility function and a function of the social preference that decides the optimal allocation. The utility function increases with increasing self-distribution amount  $y_i$ , where  $U_i = u(y_i) \frac{dU_i}{dy_i} > 0$ , whereas the function of social utility is expressed as negative utility according to its deviation from the ideal social norm as expressed above. Individuals also assign a certain weight to each material utility and social utility expressed as a load factor for each function. That is, in each individual material utility and social utility exist in parallel and that individual has a preference between them. The value function is expressed as follows:

$$\max_{y_i} V_i = U_i + S_i = \lambda_m y_i - \lambda_s \left( y_i - \frac{\Pi}{n} \right)^2$$

where  $\lambda_m$  denotes the loading factor for material utility. Thus, we can derive the following premise:

*Premise 2:* Individuals try to maximize value functions. Individuals' value functions are expressed as linear combinations of utility function and social function, each with load factors of utility and social utility.

Additionally, some experimental studies showed a variety of fairness ideals rather than only egalitarianism as is described above, but also showed that some individuals adhere to other forms of distributive justice, such as liberalist or liberal egalitarian distributions. The basic experimental design of those studies was that subjects were required to earn a specific amount of money under a given set of production rules and to distribute the money earned between themselves and the individuals they were paired with. For instance, the experiments of Cappelen et al. (2007) showed that some individuals distributed according to the earnings of

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<sup>4</sup>The original model of Fehr and Schmidt (1999) distinguished positive and negative deviation, with individuals having a stronger incentive to deviate on the positive side (e.g., in the case above the possibility exists of a positive deviation reaching as high as \$7 and a negative deviation reaching as low as \$3, representing a \$2 deviation on either side of the ideal of \$5), but for simplicity this difference is ignored here.

each team member in a production process, while others adhered to the distributive justice of liberalist egalitarianism, which considers factors individuals can control (e.g., sum invested) and ignores factors they cannot control (e.g., lottery results). Thus, we can derive the following premise:

*Premise 3:* Variety of fairness ideals or distributive justice. Individuals can hold different fairness ideals that can influence forms of distributive justice.

In the case of different fairness ideals, it is also presupposed that individuals keep premise 2, which holds that value function consists of utility function and social function, where  $V_i = \lambda_m y_i - \lambda_s (y_i - F^k)^2$ , whereas  $F^k$  denotes ideal distribution amounts according to a certain fairness ideal (e.g., egalitarian, libertarian, liberal egalitarian). Thus, we can identify the following premise:

*Premise 4:* Individuals adhere exclusively to one of the fairness ideals in a given situation. They try to maximize the value function, consisting of the utility function and the function of committed fairness. Thus, it is presupposed that individuals may be ambivalent between material utility and a certain fairness ideal, but not between different fairness ideals.

According to Hoffman and Spitzer (1985), the results of distribution experiments with production showed that experimental institutions, rules governing the game and payment, and the experimental environment strongly affected subjects' decision-making during the distribution process. They performed distribution experiments with different treatments in a production process that may reflect subjects' ability, efforts and moral consideration, and investigated how subjects' fairness ideals differed according to differences in production methods. To derive interpretations from given experimental results in different treatments, they simply summarized the premises related to preference and experimental institutions as follows: "i) Each subject concurs with a particular concept of fairness in distribution (also known as a theory of distributive justice). ii) Each subject perceives the experimental institutions as triggering a particular aspect of their concept of justice, and as indicating the distribution or set of distributions that is fair within that experiment. iii) The subject implements his perceptions of a fair distribution." (p. 260) Here, they presuppose that certain fairness ideals, which a subject potentially holds, emerge for certain given institutional conditions. This simple principle is logically expressed as  $(\forall i) (P_i \wedge R_a) \rightarrow p_{ia}$  where  $P_i$  denotes a set of social preferences (or distribution justice)  $P_i \left( p_{ik} \in P_i \mid p_{ik} = p_{i1}, p_{i2}, \dots, p_{in} \right)$  that an individual  $i$  potentially holds and  $R_a$  is a given experimental institution (rules of a game). I summarize the premise as follows:

*Premise 5:* Individuals hold a certain set of social preferences regarding distribution justice before the start of the experiment, and a certain set of experimental institutions (formal rules set in experimental design) invokes one of those preferences.



The option of distributing the entire pie to oneself is included among the fairness ideals because some individuals regard it as fair under certain situations.

### 2.4.2 *Hypotheses*

Based on the premises presupposed by the models of previous experimental studies, I here propose three hypotheses on individual incentives and behaviors in relation to distribution.

First, I shall discuss the tendency of individuals to be averse to the exposure of their own selfishness. The value function that presupposes individuals have both material utility and social utility, as explained in premises 1 and 2, is quite reasonable. We know that most individuals are neither fundamental idealists nor complete egoists, but rather are a mix of both. We live in a society that requires us to follow certain social norms (or risk social exclusion) and more or less have to be selfish to survive following the law of self-preservation. However, even given the social utility that coexists in the minds of individuals, individuals are nevertheless averse to exposing their selfishness to others, and hence we should consider the existence of a feeling of “shame.” Because social norms in themselves are constituted or internalized through the eyes of others, how others evaluate one’s behavior becomes important. Additionally, following social norms in itself may bring social advantage—such as long-term relationships based on trust or social cooperation—thus, individuals should have an incentive to be seen by others as “good” people and to try to hide their selfishness in public.

*Hypothesis 1:* Aversion to exposing selfishness. Individuals simultaneously hold social and utilitarian preferences. However, those who hold a certain degree of social preference (who are not completely selfish, but care to some extent about social norms) also have a tendency to be averse to the exposure of their selfishness and hence to have an incentive to hide it.

The second hypothesis is that individuals tend to use opportunities given within a range of formal rules to satisfy both their social and utilitarian preferences. Thus, only when they have opportunities to conceal their selfishness under given social norms do they tend to satisfy their selfishness. This kind of behavior is not apparently egoistic but belongs to what Williamson called “self-interest seeking with guile,” as is discussed in Sect. 2.2.

*Hypothesis 2:* Individuals tend to use opportunity under a given set of social rules to get advantages from the given conditions. By doing so, they satisfy their material utility while hiding their selfish motivations under certain social rules.

The third hypothesis is that individuals’ fairness ideals under certain experimental institutions are not fixed but rather shift according to opportunities they can exploit. The previous model presupposes that individuals exclusively adhere to a single fairness ideal if a certain form of distribution justice is invoked by an

experimental institution, as explained in premises 4 and 5. Individuals potentially have various fairness ideals, as is indicated in premise 3, but these ideals change according to available opportunities, and individuals tend to commit to a fairness ideal that is advantageous to their material utility. By doing so, they can satisfy both social norms and material utility, and their selfishness is hidden by the social norms they choose to follow.

*Hypothesis 3: Flexibility of fairness ideals.* Individuals, who are not completely selfish, tend to change their fairness ideals according to the opportunities provided within a given set of rules.

The concept of flexibility of fairness ideals concerns whether individuals' social norms or justice are based on the classical distinction in ethics between deontology and consequentialism. Deontology regards justice as a universal principle that decides what should or should not be done in a given situation. In contrast, consequentialism considers whether an action results in a preferable outcome. For instance, if one believes that "an eye for an eye" reflects universal justice, as maintained by deontologists, one should follow this principle in any situation, even when the committer of a wrong is the strongest individual in a society and attempts at enforcing justice are certain to fail. In the case of a consequentialist, one would consider whether acting in such a way actually brings preferable consequences. Where individuals understand justice in the sense of deontology, giving only formal rules is important because such rules simply invoke individual convictions regarding justice in universal form. However, if individuals judge justice based on whether it yields preferable outcomes, it becomes more flexible, and they should consider opportunities provided within the social rules. I do not deny some individuals hold deontologistic ideas of justice and act in a more fundamentalist way by following universal moral principles. However, this hypothesis presupposes that individuals, who are not completely selfish and have an incentive to follow social norms, try to achieve their material utility and social preferences by changing their fairness ideals according to available opportunities.

### 2.4.3 Value Functions, Fairness Ideals, and Predictions

#### 2.4.3.1 Value Function

Here, I shall explain the value functions and fairness ideals of the experiments conducted in this paper and also provide predictions based on the hypothesis above.

Following the models of Fehr and Schmidt (1999) and Cappelen et al. (2007), which are explained above, an individuals' value function for distribution is expressed as follows:

$$V_i = \lambda_m y_i - \lambda_s \left( \frac{y_i - F^{k(i)}}{\Pi} \right)^2 \quad \lambda_m + \lambda_s = 1, \quad 0 \leq \lambda_m, \lambda_s,$$

where  $F^{k(i)}$  denotes a fairness ideal of a participant  $i$ ,  $y_i$  is the amount distributed to participant  $i$ ,  $\lambda_m$  is the load factor to his material utility, and  $\lambda_s$  is the load factor to his fairness ideal. The first term in the formula on the right is a utility function, and the second term expresses that negative social utility produced as the amount  $y_i$  that is distributed to the participant himself deviates from his fairness ideal  $F^{k(i)}$ . The self-distribution amount  $y_i^*$  that maximizes  $i$ 's value function  $V_i$  is expressed as:

$$\max_{y_i} V_i : \frac{dV_i}{dy_i} = 0 \quad y_i^* = F^{k(i)} + \left( \frac{\lambda_m}{1 - \lambda_m} \right) \Pi.$$

One's optimum self-distribution  $y^*$  can be understood as a total of the ideal amount based on fairness ideals  $F^{k(i)}$ , and the amount a participant may add by selfish material utility  $\lambda_m / (1 - \lambda_m) \Pi$ . Because  $\lim_{\lambda_m \rightarrow 0} y^* = F^{k(i)}$ , the self-distribution amount  $y_i^*$  approaches the ideal fairness amount as a participant's personal load factor on material utility  $\lambda_m$  approaches zero.

### 2.4.3.2 Fairness Ideals

The self-distribution amount based on a fairness ideal  $F^{k(i)}$  that a participant  $i$  may commit can be defined as follows (see Hoffman and Spitzer 1985; Cappelen et al. 2007)<sup>5</sup>:

- **Utilitarian:**  
A utilitarian is defined as an individual who pursues self-profit and tries to maximize personal utility. Thus, a strict utilitarian will distribute team earnings entirely to himself as  $F^U = \Pi$ .
- **Egalitarian:**  
An egalitarian believes total team earnings should be shared 50:50 with the partner she is paired with. Thus, the distribution for herself is  $F^E = \Pi/2$
- **Liberalist:**  
A liberalist thinks it is fair to distribute total team earnings according to the earnings of each member in the production stage. Thus, a strict liberalist distribution is  $F^L = \pi_1$ .

Based on the value function and fairness ideals above, individuals can be classified into five types according to the difference in degree of load factor on material utility and fairness ideals, as follows:

- **Complete utilitarian:**  
This type of individual is simply understood as a completely selfish person, who monopolizes team earnings for themselves and leaves nothing for the partner he

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<sup>5</sup>Cappelen et al. (2007) also refers to a "liberal egalitarian," who distributes team earnings according to the amount each participant invested:  $m^{LE} = a_1 \Pi / (a_1 + a_2)$ . However, this chapter does not consider the liberal egalitarian concept because the experimental design produces little evidence to support it.

is paired with. Thus, his load factor to material utility is maximized ( $\lambda_m = 1$ ) and he distributes all team earnings to himself ( $y^* = \Pi$ ).

- Selfish liberalist:

This type of individual carries out a liberalist distribution, but maintains some degree of material utility ( $0 < \lambda_m < 1$ ). Thus, the amount she distributes to herself is expressed as the ideal liberalist distribution plus some amount  $\left(\frac{\lambda_m}{1-\lambda_m}\right) \Pi$ , stemming from material utility. That is,  $y^* = \pi_1 + \left(\frac{\lambda_m}{1-\lambda_m}\right) \Pi$ , where  $0 < \left(\frac{\lambda_m}{1-\lambda_m}\right) \Pi$ .

- Fundamental liberalist:

This type of individual engages in a fundamental liberalist distribution, meaning the amount distributed to themselves is identical to that under the ideal liberalist distribution:  $y = \pi_1$ ,  $\lambda_m = 0$ .

- Selfish egalitarian:

This type of individual engages in an egalitarian distribution but preserves some material utility ( $0 < \lambda_m < 1$ ). Thus, the amount she distributes to herself is expressed as an ideal egalitarian distribution plus some amount  $\alpha$ , stemming from material utility. That is,

$$y^* = \frac{\Pi}{2} + \left(\frac{\lambda_m}{1-\lambda_m}\right) \Pi, \quad \text{where } 0 < \left(\frac{\lambda_m}{1-\lambda_m}\right) \Pi.$$

- Fundamental egalitarian:

This type of individual carries out a fundamentally liberalist distribution, meaning the amount distributed to themselves is the same as under the ideal egalitarian distribution:  $y^* = \frac{\Pi}{2}$ ,  $\lambda_m = 0$ .

### 2.4.3.3 Relative Earnings and Opportunities

Based on premises 4 and 5, Cappelen et al. (2007) presuppose that given an experimental institution that invokes one of the fairness ideals of individuals also determines the load factor of material utility. Thus, it is presupposed that given three types of individuals having preference sets  $P_i, P_j, P_k$  and given a certain experimental rule  $R_a$ , three types of fairness ideals  $p_{ia}, p_{ja}, p_{ka}$  should be invoked in the experiments:  $((P_i \vee P_j \vee P_k) \wedge R_a) \rightarrow p_{ia} \vee p_{ja} \vee p_{ka}$ . In this case, the difference of opportunity given to each individual in the game rules is ignored, and thus it is presupposed that the conditions remain the same across these differences in opportunities:  $((P_i \vee P_j \vee P_k) \wedge R_a \wedge o_1) \simeq ((P_i \vee P_j \vee P_k) \wedge R_a \wedge o_2)$ , where  $o_1, o_2$  denotes different opportunities. Thus, the invoked fairness ideals should also be almost the same ( $p_{ia} \vee p_{ja} \vee p_{ka}$ ).

However, the observed results of individuals' fairness ideals can differ significantly according to given opportunities that affect individuals' implementation of distributive justice. For example,  $(R_a \wedge o_1) \rightarrow p_1$  and  $(R_a \wedge o_2) \rightarrow p_2$  are

observed relatively frequently. Suppose examinations for students. The formal rules are simple and almost identical everywhere: students are expected to solve problems through their own efforts and without cheating. Those who achieve higher scores are rewarded (e.g., by obtaining permission for enrollment). Taking examinations in either room A or room B is an opportunity given to each student incidentally. If the scores of students in room A significantly exceed those of students in room B, even when the students are randomly allocated between the two rooms, teachers should consider the possibility that students in room A are cheating. In that case, students in room A may use an opportunity given to them (e.g., inadequate test monitoring) to achieve higher scores.

Here I distinguish three groups according to their situation in relation to relative earnings and identify them with respect to whatever opportunity they have or lack. These conditions are decided using given rules and incidentally also through individual decision-making and luck, as well as the partners they are paired with. Here, I identify “opportunity” as resulting in higher self-distribution, by changing (or shifting) fairness ideals.

- *Group without opportunity: relative earnings are neutral.* In this group, the earnings of individual team members are the same, and thus relative earnings are neutral. Moreover, the ideal egalitarian and liberalist distributions are the same, in this case  $\frac{\pi}{2} = \pi_1 = \pi_2$ . This group lacks opportunity to obtain a higher distribution amount for themselves by changing their fairness ideals.
- *Group with an opportunity to shift from a liberalist to an egalitarian distribution: the relative earning for the subject controlling the distribution is lower.* In this group, the earnings of the subject *controlling* the distribution are lower than those of the partner he/she is paired with,  $\pi_1 < \pi_2$ . Thus, the ideal egalitarian distribution always results in the distributive actor receiving more than under the liberalist distribution  $\pi_1 < \frac{\pi}{2}$ . Thus, even if one invokes his preference for a liberalist distribution by experimental institutions, one can receive more by shifting his fairness ideal to egalitarianism.
- *Group with an opportunity to shift from an egalitarian to a liberalist distribution, where the relative earnings of the subject controlling the distribution are higher.* In this group, an individual's earnings exceed those of the partner he/she is paired with  $\pi_1 > \pi_2$ . Thus, under the ideal liberalist distribution the distributing partner always receives more than under the egalitarian distribution  $\pi_1 > \frac{\pi}{2}$ . Thus, even if an individual invoked his preference for an egalitarian distribution by experimental institutions, that individual can receive more for themselves by adopting a liberalist fairness ideal.

Based on the above classification and hypothesis, I propose three predictions of the experimental results.

First, individuals whose relative earnings are neutral tend to adhere to either an ideal utilitarian or ideal liberalist (=egalitarian) distribution. As discussed in Hypothesis 1, individuals who are not completely utilitarian have a tendency to be averse to their selfishness being exposed. They also do not have the opportunity

to shift from one fairness ideal to the other and so commit to the ideal amount. Second, as explained in groups with opportunities, those with higher relative earnings have an opportunity to increase the distribution amount they receive by shifting from egalitarian to liberalism. Third, those with lower relative earnings have an opportunity to increase the distribution amount they receive by shifting from liberalism to egalitarianism and vice versa. These predictions come from Hypotheses 1, 2, and 3, which refer to individuals making use of their opportunity to change their fairness ideals and satisfy their material utility without exposing it. These predictions are summarized as follows:

*Prediction 1:* Individuals who are not completely selfish and whose relative earnings are neutral tend to be fundamental liberals (egalitarians).

*Prediction 2:* Individuals who are not completely selfish and whose relative earnings are higher tend to uphold liberalist ideals of fairness as this brings them a higher distribution amount than egalitarianism.

*Prediction 3:* Individuals who are not completely selfish and whose relative earnings are lower tend to uphold egalitarian fairness ideals because these ideals bring them a higher distribution amount than being liberalist.

## 2.5 Experimental Results

I performed experiments consisting of a production stage and a distribution stage six times from November 2011 to July 2013 in the laboratory of Kyoto Sangyo University in Japan. This experiment is performed using an experimental program z-tree (Fischbacher 2007). Participants were assembled from undergraduate students attending Kyoto Sangyo University, including all departments, and the total number of participants was 134. Each experiment took approximately 30 min, including instructions. Before the game started, an experimenter read aloud an introduction describing the rule (see [Appendix](#)), after which the participants were free to ask questions. The experiment started once all participants understood the rules.

### 2.5.1 Statistical Description

Table 2.1 shows a statistical description of the experimental results. Three participants invested nothing, 32 invested 100 points, 53 invested 200 points, and 46 invested 300 points. Participant earnings ranged from a minimum of 0 points to a maximum of 1200 points, with an average of 622.38 points, and a mean of 600 points. The minimum for total team earnings was 400 points, the maximum was 2000 points, the average was 828.9 points, and the mean was 800 points. The average payment participants received was 716.42 yen. In Japan, the average

**Table 2.1** Statistical description

	$a$	$\Pi$	$\Pi$	$y$
Min	0	0	400	200
Max	300	1200	2000	2000
Average	206	622.38	1245	828.9
Mean	200	600	1200	800

payment to students for an hour of work is approximately 1000 yen (almost \$10), and thus the game result fully satisfied participants' opportunity costs.

### 2.5.2 Distribution in Group Without Opportunity

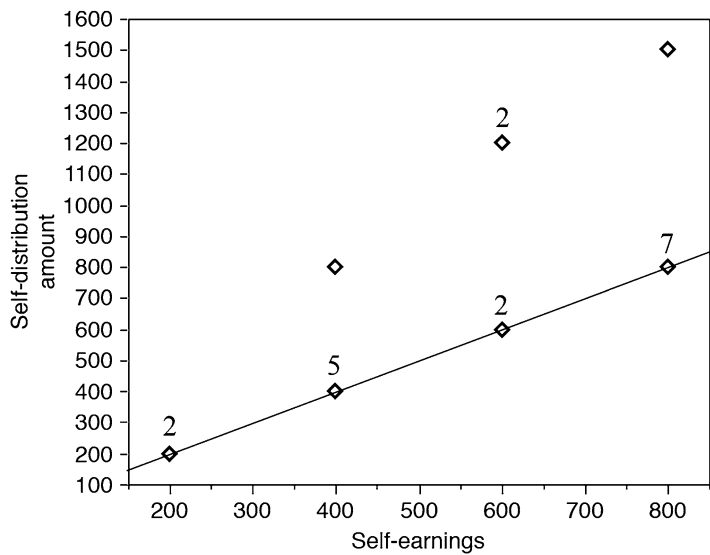
Graph 2.1 shows the correlation between self-earnings  $\pi_1$  and the self-distribution amount  $y$  for a group with neutral relative earnings. The sloping line designates points where  $y = \pi_1 = \frac{\Pi}{2}$ . Note that relative earnings are the same for the neutral group. For  $\pi_1 > \pi_2$ , one cannot distinguish participant preferences for liberalist versus egalitarian ideals because in this case the distribution amounts are the same for both. Interestingly, and in line with prediction 1, the distribution amounts for all subjects who are not completely selfish (16 subjects) precisely matched the ideal liberalist-egalitarian amount. Most of the remaining subjects committed to a utilitarian distribution were also committed to an ideal utilitarian distribution in terms of actual distribution amount (one slight exception involved a utilitarian who distributed 1500 to himself given team earnings of 1600).

The results do not seem to match the previous model consisting of material utility and fairness discussed in premise 2, because in this study individuals are either fundamental utilitarians or fundamental liberalists-egalitarians. That is, individuals' load factors on material utility and fairness are all or nothing rather than combining both.  $(\lambda_m, \lambda_s) = (0, 1) \vee (0, 1)$ . Interestingly, including the case where relative earnings are different, 85 % of subjects committed to the ideal amounts under utilitarianism, liberalism, or egalitarianism. Thus, we propose the following:

*Proposition 1:* Most subjects committed to ideal distribution rates under utilitarian, liberalist, or egalitarian distributions. That is, most subjects were complete utilitarians, fundamental egalitarians, or fundamental liberalists, rather than selfish egalitarians or selfish liberalists.

### 2.5.3 Distribution in Groups with Opportunity

Graph 2.2 shows the correlation between the predicted value according to a liberalist distribution and the observed values from self-distribution. The sloped



**Graph 2.1** Correlation between self-earning and self-distribution amounts in the group with neutral relative earnings

line designates where the liberalist distribution rate matches the self-distribution rate. The horizontal line designates where the observed value of distribution rate is 0.5, that is, the ideal egalitarian distribution. The point where the sloped and horizontal lines meet designates where relative earnings are neutral, as explained above.

In line with predictions 2 and 3, we can see many subjects with lower relative earnings (+) were plotted on the horizontal line that designates the egalitarian distribution (27 participants), while many subjects with higher relative earnings (o) were plotted on the sloped line that designates the liberalist distribution (18 participants). A few subjects with lower relative earnings who committed to the liberalist distribution (5 participants) were also observed. Similarly, a few subjects with higher earnings committed to the egalitarian distribution (5 participants), but their number was relatively low. We can also observe a few subjects with higher relative earnings plotted between the egalitarian and liberalist distributions (7 participants), though their earnings were nearer to the liberalist distribution.

2.5.4 Fairness Ideals by Opportunities

Here, I examined the correlations between different opportunities identified in relative earnings and occurrence frequencies of different fairness ideals. Because most subjects implemented an ideal distribution according to a certain fairness ideal,





**Table 2.2** Occurrence frequency of fairness ideals by relative earnings

Relative earnings	Fairness ideals				p-value <sup>d</sup>
	Utilitarian <i>N</i> = 36	Egalitarian <i>N</i> = 49	Liberalist <i>N</i> = 26	Ambivalent <sup>a</sup>	
High ( <i>N</i> = 57)	16(28.1) <sup>b</sup>	<b>14(24.6)</b>	<b>21(36.8)</b>	6(10.5)	<0.0001
Low ( <i>N</i> = 57)	16(28.1)	<b>35(61.4)</b>	<b>5(8.8)</b>	1(1.8)	
Neutral <sup>a</sup> ( <i>N</i> = 20)	4(20)	16(80)	[16(80)] <sup>c</sup>	0	

<sup>a</sup>Ambivalent describes participants who implement distributions that fall into the middle ground between egalitarian and liberalist, egalitarian and utilitarian, or liberalist and utilitarian distributions

<sup>b</sup>Numbers in brackets denote percentages

<sup>c</sup>Participants in the neutral group overlap with those in the egalitarian and liberalist distribution groups. To estimate the occurrence frequencies of the utilitarian, egalitarian, and liberalist groups, neutral participants are deselected from the population

<sup>d</sup>Estimated by Pearson's chi-squared test

implement an ambivalent distribution, and these ambivalent distributions clustered around the middle ground between the two fairness ideals.

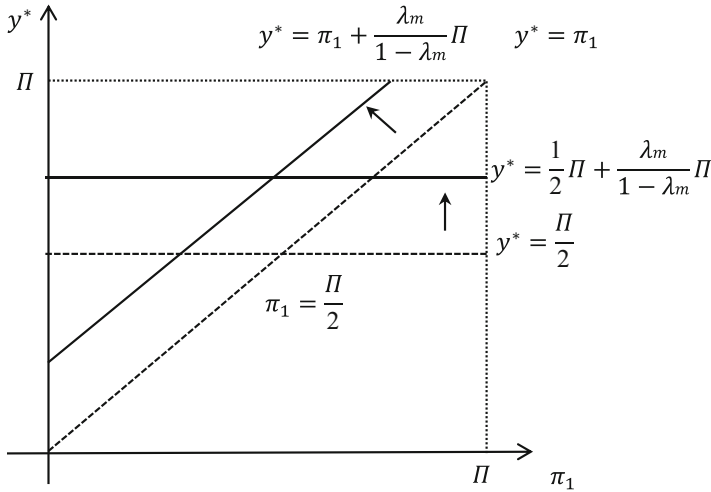
Regarding utilitarianism, I could not find a significant difference in its occurrence rate in terms of relative earnings. Participants who committed to a utilitarian distribution, i.e., those who left nothing to the partners they were paired with, were observed to act independently of their relative earnings.

From these results, I could derive the following propositions:

- *Proposition 2:* No correlation exists between implementation of utilitarian distributions and the relative earnings of the individual implementing the distribution.
- *Proposition 3:* Individuals whose relative earnings are high compared with those they are paired with tend to implement a liberalist distribution.
- *Proposition 4:* Individuals whose relative earnings are low compared with those they are paired with tend to implement an egalitarian distribution.

2.6 Discussion

As summarized in Proposition 1, the experimental results of this study show that most participants (85 %) proposed distribution amounts completely compatible with either one of ideal utilitarianism, liberalism, or egalitarianism. Seven percent of participants committed to a median amount between two of these three ideals. This result is not congruent with the expectations of previous models summarized in premise 4, which describes individuals' value functions and consists of a linear combination of material and social utility and the load factor held by each individual



**Fig. 2.1** Distribution of the previous model

to each utility.<sup>6</sup> In this model, the optimum distribution is a total of the ideal amount of fairness and the amount considering the “amount added owing to selfish incentives,”  $y^* = F^{k(i)} + \frac{\lambda_m}{1-\lambda_m}\Pi$  ( $0 < \lambda_m < 1$ ). Thus, the distributions implemented by individuals who are not completely selfish should be observed in forms of selfish liberalism or selfish egalitarianism, as explained in Sect. 2.3.

Figure 2.1 shows that the optimal distribution for the actor implementing the distribution  $y^*$  expected by previous models, as amounts of an ideal fair distribution (egalitarian or liberalist) with additional selfish amounts. The dotted horizontal line in Fig. 2.1 expresses egalitarian ideal amounts:  $y^* = \frac{\Pi}{2}$  egalitarian participants are expected to implement a distribution that gives themselves the amounts on the upward diagonal line  $y^* = \frac{1}{2}\Pi + \frac{\lambda_m}{1-\lambda_m}\Pi$ . Similarly, liberalist participants are expected to implement a distribution that gives themselves the amounts on the diagonal line shifted from the dotted diagonal line  $y^* = \pi_1 + \frac{\lambda_m}{1-\lambda_m}\Pi$ , which expresses liberalist ideal amounts, with these additional amounts taken based on selfish incentives, as is shown in Fig. 2.1. However, those additional amounts are observed in few participants in the experiment, and this phenomenon should be explained.

Do the experimental results mean that most subjects were either completely selfish or fundamental idealists? I think the premises of the previous model that presupposes that individuals hold both material and social utility are quite reasonable. However, the model overlooks another incentive of individuals, namely, that they are averse to the exposure of their selfishness as explained in Hypothesis

<sup>6</sup>Fehr and Schmidt (1999) themselves admit the linear model is not completely compatible with experimental observations (p. 847).

1. Because a social norm in itself is explained as an internalization of other people's views (cf. Smith 1759), it is strongly associated with a sense of shame. The "additional amounts by selfish incentives" described above imply the exposure of individual selfishness even in individuals whose behavior is consistent with a certain social norm. However, even if individuals are averse to the exposure of their selfishness through behavior consistent with certain social norms, their incentives to material utility will remain.

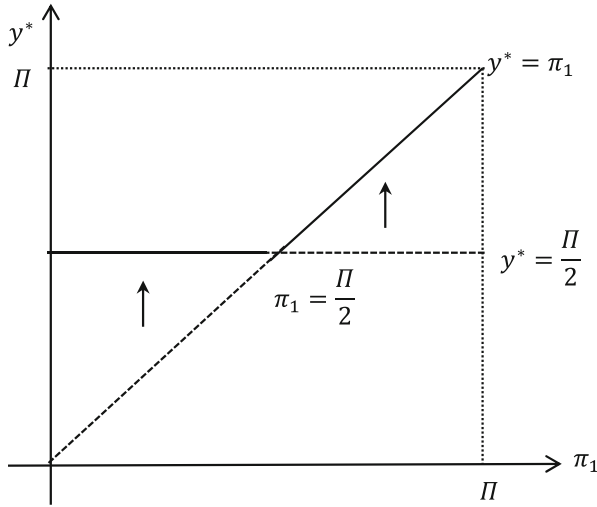
According to Festinger (1957), individuals that hold contradictory beliefs and consequently experience mental discomfort reflect what he calls "cognitive dissonance." Moreover, individuals experiencing cognitive dissonance try to resolve psychologically uncomfortable situations *by changing their beliefs*. For instance, the fox in Aesop's fables, having failed to obtain a grape, tried to resolve the cognitive dissonance between his desire for grapes and his frustration by changing his belief from "grapes are sweet" to "grapes are bitter." Experimental results show that the commitment of an individual to a given distribution principle can be understood as an outcome of an attempt to resolve their "cognitive dissonance" stemming from contradictory cognitions between material and social utility. Committing to a certain distribution principle may be followed by personal efforts to resolve cognitive dissonance.<sup>7</sup>

Propositions 2 and 3 summarize the experimental results that show a participant's commitment to liberalist or egalitarian fairness ideals significantly depend on their relative earnings. In the experiments, participants whose relative earnings were higher than those they were paired with displayed a significant tendency to commit to a liberalist distribution, whereas those whose relative earnings were lower tended to implement an egalitarian distribution. This result contrasts with previous studies that presuppose individual fairness ideals are invoked by experimental institutions, as summarized in premise 5. Because relative earnings incidentally give opportunities to subjects, not experimental institutions, if experimental institutions only affect the fairness ideals of subjects, they should be independent from relative earnings.

The experimental results show that individuals who engaged in opportunistic behaviors, namely, those who selected more *advantageous* fairness ideals (to satisfy distributive justice and their selfishness), did so because of their resolution of cognitive dissonance. Figure 2.2 describes the relation between relative earnings and fairness ideals. The left half of Fig. 2.2 indicates the range of lower relative earnings, whereas the right half indicates the range of higher relative earnings. Where relative earnings are lower, the egalitarian distribution  $y = 1/2\Pi$  always brings a higher self-distribution than the liberalist distribution  $y = \pi_1$ ; where relative earnings are higher, a self-distribution based on liberalist principles is always higher than one based on egalitarian principles and vice versa. As shown by

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<sup>7</sup>Rabin (1994) states that cognitive dissonance decreases people's commitments to reciprocity because they cannot be completely ethical and then commit to selfish behavior without cognitive dissonance. For discussion on material utility and individual decision-making, see Konow (2000).



**Fig. 2.2** Distribution of the opportunist model

the arrows in Fig. 2.2, participants have shifted their fairness ideals from liberalist to egalitarian given lower relative earnings and from egalitarian to liberalist under higher relative earnings. If participants' fairness ideals are coherent and independent of their relative earnings, those participants committed to egalitarianism should always distribute their team earnings 50:50, whereas participants committed to liberalism should implement an earning-based distribution. Such fundamentalist behaviors can be observed but are rare. Many participants prefer fairness ideals that bring them higher relative earnings: individuals with higher relative earnings display a significant preference for a liberalist distribution, whereas those with lower relative earnings prefer an egalitarian distribution.

As discussed in relation to the group without opportunity in Sect. 2.2, Williamson (1975) describes opportunistic behavior in terms of individuals seeking self-interest "with guile" while following social norms or rules. If a participant determines the self-distribution amount by adding a "selfish amount" to the ideal fair amount, as shown in Fig. 2.1, then that added amount exposes his selfishness. However, if an individual "commits" to a more advantageous fairness ideal, as expressed in Fig. 2.2, then her selfishness becomes hidden. On the surface, she seems to be a strict liberalist or egalitarian individual. In this sense, the premise of the previous model consisting of material and social utility is correct, but opportunities such as prevailing conditions and the flexibility of individuals' fairness ideals should be taken into consideration.

Interestingly, all subjects who were not utilitarian in the group with neutral relative earnings committed to precise liberalist-egalitarian distributions. As proposed in Hypothesis 1, this should come from those subjects in this group that lack opportunity to change their fairness ideals to increase their material utility.

In this group, the risk of exposure of selfishness is higher than in those groups with opportunities. Because if a subject who implements an earning distribution that is neutral to herself is being a selfish egalitarian (liberalist) such as  $\Pi/2 + \alpha$  ( $0 < \alpha$ ), it is obvious that this addition of  $\alpha$  is the result of their selfishness. On the contrary, the actions of subjects who implement distributions that see themselves receive a larger “additional amount” may be justified by liberalist fairness ideals rather than selfishness. Such subjects may believe that an egalitarian distribution is appropriate in this situation but based on liberalist ideas may also believe that they can legitimately add some amount for themselves over and above what they would receive under an equal distribution. The beliefs of such an individual may be motivated by having earned more than his partner. The logic is the same for a subject with lower earnings who is originally liberalist but shifts to become egalitarian. In Graph 2.2, we find a few subjects plotted in the triangle zones between egalitarian and liberalist. Thus, we could conclude that not only experimental institutions matter but opportunities also matter for the decision-making of subjects regarding distribution.

A possible criticism is that a group with higher relative earnings is likely to be classified as liberalist because “added material utility” lacks validity. This is because all non-selfish subjects that belong to a group with neutral relative earnings concentrated on precise amounts of fairness. Sixteen subjects were plotted at the point where the horizontal and slash lines are closest—the point relative earnings are the same in Graph 2.2. These data do not match the previous model described in Fig. 2.1, in which individuals add some selfish amount to the ideal fair amount. Even if we admit that each individual has a different degree of material utility, that amount should be distributed equally among subjects if it is independent of difference of opportunity. However, if we interpret the data as indicating that individuals with opportunities are more selfish than those without opportunities, we should conclude that the opportunities are conditions that cause individuals to add their material utility to the ideal amount of fairness.

As argued by Levitt and List (2007), besides morals, social norms are another important motivator of individual behavior. If an individual exposes his selfishness to others in an obvious way, he may be afraid of receiving a social sanction for violating norms. Individuals with different directional incentives related to fairness and selfishness might strategically “select” a more advantageous fairness ideal from among two possible distribution opportunities, rather than expose their selfishness by adding “selfish amounts” to their ideal fair share. Here, we can discover behavior that does not deviate from distributive justice, but statistically uses opportunities through *hidden and selfish incentives*. Opportunistic behavior allows an individual to satisfy his selfish incentives to an extent, without deviating from social norms. The previous models presupposed that an individual’s optimum distribution amount can be defined such that “extra amounts resulting from selfish incentives” are added to the ideal amount according to a certain fairness ideal. However, the experimental results obtained in this paper show that individuals have a significant tendency to exclusively commit to a single distribution principle—whether strict utilitarianism or some other fairness ideal—and thus the value function of the previous model

cannot satisfactorily explain the result. According to the experiments presented in this research, this tendency is an outcome of individuals' efforts to resolve the cognitive dissonance between their desire to maximize their material utility and fairness ideals through opportunistic behavior.

Applying the experimental results to real situations of opportunism, we could see the same mechanisms of satisfaction with both selfishness and a social norm utilizing opportunity. Suppose that a company requires a worker to perform a certain task until a specific deadline. To maintain task performance at a high level of quality until the given deadline requires that the worker do his best, but the worker always has selfish incentives to reduce his burden. If this was a case in which the company imposed a penalty for work delays, the worker may neglect his work by reducing his work quality to maintain work speed and avoid being penalized. If the company strictly checks quality, the worker may instead neglect his work by slowing down and extending deadlines. In this case, we regard the worker as strict about neither punctuality nor quality, but rather as an opportunist. Both actions are understood in terms of the worker making use of the opportunities available to him to satisfy his selfishness within the terms of the formal contract and social framework. In case a task delegation transaction occurs within a company with which that worker has longer relations, there should be less room for opportunism. In this way, transaction cost should be explained as strongly related to opportunistic behavior.

## 2.7 Conclusions

In this chapter, I demonstrated that many individuals do not fundamentally commit to a certain fairness ideal invoked by a certain experimental institution; instead, they strategically select an advantageous option from among several possible "fair" distribution principles. If an individual is not a strict utilitarian, willing to ignore social norms and pursue selfish behavior, he tends to hide his selfish motivation. Such an individual may strategically "select" a fairness ideal that is personally profitable without making any further selfish additions, thus hiding his selfishness and satisfying ethical (or social) justifications—all to resolve the cognitive dissonance between material utility and fair distribution.

Figure 2.3 summarizes three individual behaviors that emerged from fairness ideals and material utility. Behavior A describes some participants as fundamentally liberalist or egalitarian and as remaining faithful to a given form of distributive justice and then distributing earnings according to a coherent set of fairness ideals regardless of the situation. Behavior B reveals the more opportunistic behavior of individuals who opportunistically change their fairness ideals according to relative earnings. Their incentives arise from both fairness ideals (adhering to social norms) and hidden selfishness (to satisfy their material utility). Behavior C describes those who are purely motivated by material utility and who are not reluctant to hide their selfish incentives.

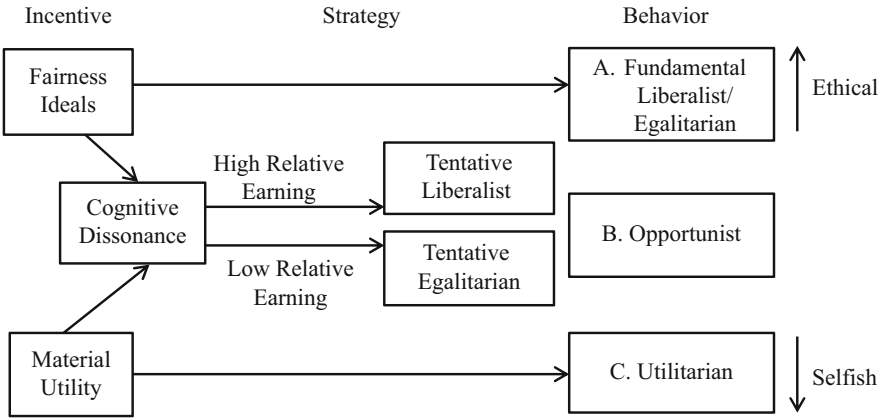


Fig. 2.3 Incentives and behaviors

Opportunists should not be classified as purely selfish or purely ethical because both these incentives are simultaneously present and individuals strategically hide their selfish incentives and assume “fair” behavior. Those who pursue opportunistic behaviors may suffer cognitive dissonance between distributive justice and selfishness and then strategically exploit different opportunities. By behaving opportunistically, individuals may be able to satisfy their selfishness within the contexts of social norms or given institutional conditions.

## Appendices

- Experiment instructions

Thank you very much for attending this economic experiment. An experimenter will now explain the rules of the game. Please read the instructions below carefully to ensure you understand the rules of the game. You can raise your hand to ask a question at any time should anything be unclear.

### 1. Endowment

You will be given 300 points as an initial endowment in this game. You can invest the points in a lotto game in units of 100 points. You can choose to invest either all, some, or none of the initial endowment points in this way. That is, you can select among investment amounts of 0 point, 100 points, 200 points, and 300 points. Points that are not invested will be counted when calculating your final profit.



## 2. Lotto

You will receive the winnings of the lotto game should you choose to invest in this way. There is a 50 % probability of receiving winnings that total either four times your investment (“very lucky”) or two times your investment (“lucky”) and a 50 % chance of receiving no winnings. Any points earned through the lotto game are counted toward your final score.

For example, if you invested 100 points and won a “very lucky” lotto prize, your earnings would total:  $100 \times 4 = 400$  400 points.

## 3. Pair (two-member team)

You are randomly matched with another participant to form a two-member team. The identity of your partner is unknown to you, as well as to other participants and experimenters both during and after the experiment.

## 4. Team earnings

You and your partner’s earnings are summed to form the earnings of your team. The team earnings are shown to you and your partner on each screen, together with information on the investment points, lotto results, and total earnings for each team member.

## 5. Distribution proposal

After team earnings are shown on the screen, please make a distribution proposal regarding the sharing of team earnings between you and your partner. The total of the points you distribute to yourself plus those distributed to your partner should equal the total team earnings.

For example, for total team earnings of 1000 points:

Distribution for myself, 500; distribution for my partner, 500

## 6. Final profit

Of the two distribution proposals, the one you made and the one your partner made, one is randomly chosen. The team earnings are then distributed according to the chosen distribution proposal. Any points you did not invest are counted toward your final profits.

## 7. Points conversion and payments

Points are counted as 1 point equaling 1 yen and are paid at the conclusion of the experiment.

If there is anything you do not understand about the game, please raise your hand to ask.

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Social Preference, Institution, and Distribution

An Experimental and Philosophical Approach

Tokumaru, N.

2016, XII, 165 p. 24 illus., 2 illus. in color., Hardcover

ISBN: 978-981-10-0136-9