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Source: *American Journal of Sociology*, Vol. 104, No. 1 (July 1998), pp. 165-194

Published by: The University of Chicago Press

Stable URL: https://www.jstor.org/stable/10.1086/210005

Uncertainty, Trust, and Commitment Formation in the United States and Japan[1]

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A theory of trust proposed by Yamagishi and Yamagishi provides the basis for the prediction that (1) social uncertainty promotes commitment formation between particular partners and (2) high trusters tend to form committed relations less frequently than would low trusters when facing social uncertainty. These predictions receive support in two experiments conducted in the United States and Japan. The findings provide empirical support for the theory of trust that emphasizes the role of general trust (trust in others in general) in emancipating people from the confines of safe, but closed relationships. The results also offer a theoretical explanation for what have been viewed in the past as cultural differences.

INTRODUCTION

Intense family ties prevent trust from developing beyond the confines of the family. This is the central thesis of Fukuyama's (1995) book on trust. From a similar theoretical perspective, Yamagishi and his associates (Kiyonari and Yamagishi 1996; Yamagishi and Yamagishi 1989; Yamagishi

[1] The research presented in this article was supported by scientific research grants from the Institute of Nuclear Safety Systems and the Japanese Ministry of Education. We would like to thank J. Misumi of the Institute of Nuclear Safety Systems for his support and encouragement of our research project. We are also grateful to Nahoko Hayashi, Nobuhito Jin, Nobuyuki Tahakashi, Yoriko Watanabe, Motoko Kosugi, Masanori Takezawa, Shawn Donnelly, and Bob Duniway for their assistance in conducting experiments. Please address correspondence to Toshio Yamagishi, Faculty of Letters, Hokkaido University, N10 W7 Kita-ku, Sapporo, Japan 060. E-mail: Toshiolet.hines.hokudai.ac.jp

0002-9602/98/10401-0005$02.50

1995*c,* 1995*d,* 1996, in press; Yamagishi and Komiyama 1995; Yamagishi et al. 1996; Yamagishi and Yamagishi 1994, in press; Yamagishi et al. 1995) have conducted research that confirms the proposition that intense group ties, often observed in collectivist cultures, prevent trust from developing beyond group boundaries. The proposition—strong family and group ties confine "trust" to within the boundaries of the family and the group—advanced by these and other scholars (e.g., Gellner 1988; Hawthorn 1988) makes intuitive sense on the one hand, but at the same time it contains counterintuitive implications. In particular, it implies that societies characterized by a prevalence of strong social ties (such as Japanese society) produce less trust among their members than do societies in which social and interpersonal ties are weaker. This implication is counterintuitive since it is commonly believed that a society characterized by strong social and interpersonal relations, such as Japanese society, is also characterized by a high level of trust among its members.

Despite this common view and consistent with the implication of the above proposition, cross-societal research comparing the United States and Japan has repeatedly demonstrated that the level of general trust is much higher in American society than in Japanese society. First, based on the above proposition, Yamagishi and Yamagishi (1994) derived the prediction that the average level of general trust (i.e., trust in others in general) would be higher among Americans than among the Japanese and confirmed this prediction in results obtained from a cross-societal questionnaire survey. Although this survey did not use nationally representative samples, another, more systematic study conducted by the Institute of Statistical Mathematics (Hayashi et al. 1982) using representative national samples reports a similar cross-national difference. According to this study, 47% of the American sample ($N = 1{,}571$) responded "People can be trusted" to the question, "Do you think you can put your trust in most people, or do you think it's always best to be on your guard?" In contrast, only 26% of the Japanese sample ($N = 2{,}032$) gave the same response. Similarly, 47% of the American sample, compared to 19% of the Japanese sample, answered that people try to be helpful when asked, "Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?"

Building on the proposition that strong and stable social relations (such as family ties and group ties) promote a sense of security within such relations but endanger trust that extends beyond these relations, Yamagishi and Yamagishi (1994) provided an explanation for the counterintuitive, but consistent, finding that Americans are more "trusting" than the Japanese. The purpose of this study is to provide further empirical support for the theory of trust proposed by Yamagishi and his associates. After

describing the theory we present findings from two cross-societal experiments conducted in the United States (Seattle) and Japan (Sapporo).

INSTITUTIONAL VERSUS INDIVIDUALISTIC VIEWS OF CULTURE

The theory of trust developed by Yamagishi and his associates is primarily based on the contrast between institutional and individualistic views of culture. Yamagishi (1988*a*) compared the tendencies of American and Japanese subjects to desert to a group that contained free riders. The common view of the cultures in American and Japanese societies—the former characterized by individualism and the latter by collectivism—would imply that Japanese subjects would have a stronger preference to stay in the group than Americans would, given the existence of free riding on the part of other group members. Contrary to this simplistic view of American and Japanese cultures, the results of this experiment indicated that the tendency to remain in the group was much stronger among the American subjects than it was among the Japanese. More specifically, American subjects exited the group on only slightly more than one out of 20 trials when they incurred monetary costs (i.e., in the high-exit-cost condition) for leaving, whereas Japanese subjects exited the group much more frequently (on about eight out of 20 trials), despite the fact that they earned much less money by doing so. This difference in exit rates did not exist between American and Japanese subjects when the exit costs were low (i.e., in the low-exit-cost condition). These results indicate that both American and Japanese subjects disliked staying in a group with free riders, as evidenced by the high level of exit responses among both groups in the low-cost condition. However, American subjects stayed in the group when the exit response was costly, whereas Japanese subjects were willing to pay extra for the exit option. These results would be difficult to explain in terms of the individualistic view of culture. If Japanese people are collectivist in the sense that they prefer to be part of the group rather than independent from the group, and if American people are individualistic in the sense that they value independence from the group, then American subjects should have exited more often than did the Japanese subjects in this experiment regardless of cost.

This seemingly counterintuitive pattern of findings was predicted by Yamagishi (1988*a*) based on what he calls the "institutional view" of culture. According to this view, the Japanese often "prefer" to belong to groups and place group interests above their own individual interests not because they intrinsically like to do so, but because it is in their own long-term interest. In the context of free riding in a collective work group, Japanese society has developed systems of mutual monitoring and sanc-

tioning to curtail free riding (Hechter and Kanazawa 1993), and these solutions work for the group insofar as such a "collective solution" to the free rider problem is in place. However, in groups artificially created in the laboratory without opportunities for face-to-face interaction (i.e., in the groups used in Yamagishi's experiment) such collective solutions as informal mutual monitoring and sanctioning do not exist. In such a situation, Japanese people tend to prefer not to stay in the group, as indicated by the experimental results. A collectivist culture did not exist among the Japanese subjects who participated in this experiment because the artificially created groups lacked opportunities for the mutual monitoring and sanctioning of each other's behavior.

Another experiment by Yamagishi (1988*b*) provides an even clearer contrast between the individualistic view of culture and this institutional view of culture. In a cross-societal experiment between the United States and Japan comparing cooperative tendencies in social dilemmas, subjects in four-person groups were each given 50¢ (U.S.) or ¥100 (Japan)[2] and were asked how much of the money they wanted to provide for the welfare of the other group members. They could contribute any amount between zero and 50¢ or ¥100. The amount provided by the subject was doubled in value and then equally allocated among the other three members. Thus, if all four contributed the full amount, each earned $1 or ¥200. However, the subject could have earned more ($1.50/¥300) if he or she had not contributed any while the other three fully contributed. The decision was repeated 12 times (Japan) or 16 times (U.S.), and thus the pure free rider could earn $1.50 times 16 ($24), or ¥300 times 12 (¥3,600). These amounts were smaller than those they would have obtained if all four kept contributing in full ($16 or ¥2,400). Thus, not contributing at all was the dominant or "rational" choice. However, if everyone had chosen this dominant response each would have earned only 50¢ or ¥100 per trial and $8 or ¥1,200 in total. This situation represents a social dilemma in which (1) each member has a choice between C (cooperation, contributing the full amount) and D (defection, contributing nothing), (2) the choice of D produces a better outcome for a member than the choice of C regardless of the choices of the other members, and yet (3) the individual outcome when all members choose D is worse than the individual outcome when all choose C (see Dawes [1980], Messick and Brewer [1983], and Yamagishi [1995*b*], for reviews of the social dilemma literature).

The individualistic view of culture—that Japanese individuals value group interests over individual interests more so than Americans do—predicts that Japanese subjects are more likely to cooperate in this experiment than are American subjects. On the other hand, the institutional

[2] At the time of the experiment, $1.00 was worth about ¥200.

view of culture—that Japanese individuals cooperate with the group because there exists a system of formal and informal mutual monitoring and sanctioning—predicts that Japanese subjects will cooperate less than American subjects will in such an experimental social dilemma. This is because the Japanese are so accustomed to an environment in which collective systems of mutual sanctioning guarantee mutual cooperation in the group that they would feel insecure in a social environment lacking such a system of mutual monitoring and sanctioning. Using this reasoning, Yamagishi (1988*b*) predicted that Japanese subjects would have a lower level of trust in strangers and would cooperate less in social dilemmas involving strangers compared to the behavior of American subjects. This prediction also received clear empirical support. Contrary to the individualistic view of culture, and consistent with the institutional view, American subjects in this experiment cooperated more often (contributing 56.2% of 50¢ per trial) than did Japanese subjects (who contributed 44.4% of ¥100 per trial). Furthermore, the questionnaire data showed that the American subjects were more trusting than the Japanese were.[3] That is, in a group consisting of strangers, lacking opportunities for mutual sanctioning, American subjects voluntarily cooperated and contributed more to the welfare of the group than the Japanese subjects did. On the other hand, in another condition in which subjects were given opportunities to sanction each other, the Japanese subjects became much more cooperative. With the addition of opportunities for mutual sanctioning, Japanese subjects' average cooperation level increased from 44.4% to 74.6%, an improvement of 30 percentage points. In contrast, the sanctioning opportunities did not have as strong an effect on the Americans. The sanctioning opportunities improved the average cooperation level of the American subjects' from 56.2% to 75.5%, an improvement of 19 percentage points. It was thus shown that the "collectivist" behavior—cooperation for the welfare of the group as a whole—among the Japanese subjects was maintained to a large extent by the system of mutual monitoring and sanctioning, rather than by their presumed "value system" according to which each individual places the group's welfare above his or her own self-interest.

A THEORY OF TRUST

Yamagishi and his associates have developed the "emancipation" theory of trust as a theoretical extension of the institutional view of culture pro-

[3] Earlier studies by Yamagishi and his associates (Yamagishi 1988*b,* Yamagishi and Yamagishi 1994) also report a similar difference in the level of general trust between American and Japanese respondents.

posed in their cross-societal experiments.[4] According to this theory, general trust (trust in others in general) and commitment formation are considered alternative solutions to the problems caused by social uncertainty. Social uncertainty is ubiquitous in human society. Whenever we interact with others we face the problem of social uncertainty. We engage in social interactions with others to improve our own welfare, material or psychological; however, in interacting with others we make ourselves vulnerable. We seek to improve our welfare while taking the risk of incurring costs. We use the term "social uncertainty" to refer to the risk of being exploited in social interactions. That is, social uncertainty is defined as existing for an actor when (1) his or her interaction partner has an incentive to act in a way that imposes costs (or harm) on the actor and (2) the actor does not have enough information to predict if the partner will in fact act in such a way.

Kollock (1994) provides a good example of how social uncertainty promotes commitment between particular exchange partners.[5] The examples he uses are rice and rubber markets in Southeast Asia. The quality of rice is immediately apparent upon simple inspection. The buyer has little risk of being cheated on the quality of rice he buys, and thus he faces a low level of social uncertainty. In contrast, the quality of raw rubber is hard to judge; its quality can be known only after it has been processed. Cheating on quality is easier, and the consequence of being cheated in this situation is extremely serious. In other words, the buyer of raw rubber thus faces a high level of social uncertainty. This difference in social uncertainty concerning the quality of rice and rubber, Kollock argues, explains the observed difference in the dominant form of trade. Rice is usually traded at open markets between strangers, whereas rubber is often traded between a particular producer and a broker who have formed a long-term relationship, often extending over several generations. A high level of social uncertainty concerning the quality of rubber is the determining factor for the development of such committed relations between rubber producers and brokers (see also Akerlof 1970). The experiment Kollock conducted is a laboratory version of rice and rubber trades. In one condition (the high uncertainty condition), sellers could lie to their

[4] We call these experiments "cross-societal" rather than "cross-cultural" since their purpose was to show that cultural differences can be often be explained in terms of other, more tangible theoretical variables.

[5] The term "commitment" in this article is used in a strictly behavioral manner. One is defined as committed to a relationship to the degree that he or she forgoes better alternatives. Mutual attraction, liking, and loyalty may emerge in such a committed relation, and when they do, they will certainly strengthen the commitment. Nevertheless, such psychological factors, however strongly related to commitment, are not commitment itself in this sense.

potential buyers concerning the quality of the product they sold. In the other condition (the low uncertainty condition), sellers could not lie. The results of Kollock's experiment demonstrated that commitment formation between a particular seller and a particular buyer occurred more frequently in the high uncertainty condition than in the low uncertainty condition.

Commitment formation as a solution to problems of social uncertainty, however, has its own problems. While reducing the risk of being duped in interacting with unfamiliar people,[6] it limits the actor's choices for exploring better opportunities that might exist outside the current relationship. Using terminology from economics, commitment formation reduces transaction costs, on the one hand, but imposes opportunity costs, on the other. In forming a commitment with a particular partner, one obtains security (i.e., a reduction in social uncertainty) in exchange for opportunities. Commitment formation is an efficient means for reducing uncertainty in a situation in which outside opportunities are limited (i.e., when the general level of opportunity costs is low). On the other hand, such commitments become a liability rather than an asset as people face more and better opportunities outside their current, mutually committed relationships (i.e., when the general level of opportunity costs in the environment is high). General trust (or trust in people in general) provides a springboard for people who have been "confined" to committed relationships to move out into the larger world of opportunities.[7] In this way general trust

[6] According to Yamagishi and Yamagishi (1994), social uncertainty is reduced in committed relations for the following reasons. First, committed partners accumulate information about each other. Second, "hostage-taking" behaviors, which range from the formation of mutual emotional attachments to the establishment of relation-specific assets (Helper and Levine 1992), develop in mutually committed relations; these hostage-taking behaviors provide deterrence against unilateral defection (Shapiro, Sheppard, and Cheraskin 1992). Finally, strategies such as tit-for-tat can be used to control each other's behavior (cf. Axelrod 1984).

[7] Yamagishi and Yamagishi (1994) mention four reasons for the difficulty people have in leaving a committed relationship even when it becomes a liability. First, committed people are by definition those who stay with the current relations despite outside opportunities (see n. 3 above). They may eventually leave the committed relationship, but there typically is a substantial time lag. Secondly, the mutual attraction and loyalty that have developed through the relationship keep partners in the relationship. Third, a temporary better offer from outsiders would not be sufficient for the one who has invested in relation-specific assets (see n. 4 above) to leave the current relationship. Social and psychological assets, such as the warm memory of a pleasant past and mutual understanding, may be considered relation-specific assets that keep people in these relationships. Finally, commitment to a particular partner often reduces the level of trust in "outsiders" (see Kiyonari and Yamagishi [1996] for experimental support), creating a vicious cycle of distrust of outsiders; those who do not trust "outsiders" tend to stay in committed relationships, and because they avoid "outsiders" they become even less trusting of "outsiders."

emancipates people from the confines and security of stable, committed relationships.[8]

In Japanese society the stability of interorganizational as well as interpersonal relationships makes exploitative, short-term profit-maximizing behavior less profitable than in American society. The one who deserts a relationship for quick profit will have a harder time in a society in which other relationships are mainly closed to outsiders. In other words, the stable nature of social and organizational relationships reduces social uncertainty and provides security inside of such relationships. This sense of security is what is often considered "trust" when characterizing the Japanese scene. However, once such sociorelational bases of security are removed, the Japanese may feel more insecure than Americans do. When facing strangers outside of established relationships, the Japanese are more distrustful of others in general. In short, in contrast to Americans, Japanese feel a greater sense of security within established and stable relationships but are more distrustful of people outside of the context of such relationships.

In the experiments presented below, we conduct empirical tests of critical aspects of the theory of trust briefly described above. The first experiment tests the proposition that social uncertainty facilitates commitment formation. In the second experiment, we test another critical proposition that trust emancipates people from committed relationships. These two experiments were conducted in the United States and in Japan in order to demonstrate that the theory applies to both societies and helps to explain what have previously been viewed as strictly cultural differences.

[8] We do not discuss here the mechanism by which people living in such an environment come to acquire a high level of general trust. Being fully aware of the potentially quasi-functional nature of our argument without such a mechanism, we are proposing elsewhere how investment in cognitive resources provides such a mechanism (Yamagishi 1995*a,* 1996), according to which general trust is a by-product of cognitive investments. That is, those who have dedicated a significant proportion of their cognitive resources to developing skills to discern trustworthy from untrustworthy people can afford to maintain high default expectations of others' levels of trustworthiness. By maintaining a high level of general trust, they enjoy the advantage of being able to explore fully those opportunities that lie outside their established relationships. At the same time, they can quickly pull out of potentially harmful or costly relationships at the first sign of risk. Those who have not made such cognitive investments are slow in detecting the signs of untrustworthiness in their partners and thus are less likely to explore potentially fruitful, but risky relationships. Consistent with this model, several experimental studies (Kikuchi, Watanabe, and Yamagishi 1995; Kosugi 1996; Kosugi and Yamagishi 1995) have shown that compared to low trusters, high trusters are more sensitive to information potentially revealing other people's trustworthiness and are more accurate in discerning trustworthy people from those who are untrustworthy.

EXPERIMENT 1

The first study examines the key proposition tested by Kollock (1994) in his investigation of differences in situations such as those reflected in the comparison of rice and rubber markets. Kollock's experiment simulated transactions between buyers and sellers. In one condition (the uncertain-quality condition), the true quality of the goods sold by sellers was known only to the seller. The seller announced the quality of the goods he or she offered to sell to a potential buyer, but only the seller knew the truth. Buyers in this condition could be deceived concerning the quality of the goods they were buying. In the certain-quality condition, the quality of all goods offered for sale were transparent to everyone, including both the sellers and the buyers. We also simulated trading practices between buyers and sellers. However, our experiment differed from Kollock's in three respects. First, only one person (a buyer) was the actual human subject in our study. The rest were "simulated actors" or programmed responses by a computer. This change provided us with a chance to test the predictions under a more controlled environment. Second, we developed a more powerful manipulation of social uncertainty. In addition to allowing sellers (through simulated responses) not to reveal the true quality of their goods, we also gave them the chance to extort money from the buyer. The potentially negative consequences of buying from the wrong seller in this experiment are thus much more serious than in Kollock's original experiment. Finally, we replicated the same experiment in the United States and in Japan to investigate the generality of the proposition across two different cultures. Although the literature on Japanese society and Japanese business emphasizes the stable and long-term nature of interpersonal and interorganizational relations in Japan, we predict that the level of commitment formation would be the same among Americans and Japanese when they face the same level of social uncertainty and when they are matched on their levels of trust. Specifically, we tested the following two hypotheses derived from our theory of trust.

HYPOTHESIS 1.—*Social uncertainty will facilitate commitment formation between particular partners.*

This hypothesis was originally developed by Cook and Emerson (1978) and was successfully tested by Kollock (1994). According to Kollock, when faced with a high level of social uncertainty or "a situation in which one can be taken advantage of, the natural response is to restrict one's transactions to those who have shown themselves to be trustworthy (i.e., becoming committed to particular exchange partners)" (1994, p. 318). Furthermore, construction of a mutually committed relationship transforms the "one-shot" interactions into "iterated" interactions, using game theoretic terms, and thus makes cooperative choices individually more profitable

than noncooperative choices as the prisoner's dilemma literature (cf. Axelrod 1984) indicates. The expectation of future benefits removes uncertainty (i.e., the chance of being exploited by the partner) from a mutually committed, long-term relationship. In other words, the benefit expected in the future provides assurance of the partner's willingness to act in a benign manner. Finally, the literature on prisoner's dilemma networks (Hayashi 1993, 1995; Hayashi, Jin, and Yamagishi 1993; Jin, Hayashi, and Shinotsuka 1993; Schuessler 1989; Vanberg and Congleton 1992; Yamagishi and Hayashi 1996; Yamagishi, Hayashi, and Jin 1994) provides further experimental and simulation evidence that people facing social uncertainty tend to form mutually committed relationships. The situation studied in this literature is a "prisoner's dilemma network" in which people select partners to play prisoner's dilemma games with (i.e. interaction situations characterized by a high level of social uncertainty). It has been established in this literature that one of the most effective strategies in prisoner's dilemma networks is the tit-for-tat strategy (Axelrod 1984; Hayashi 1993, 1995), according to which a player keeps cooperating with a cooperative partner and deserts the partner as soon as he or she fails to cooperate. The player who has adopted this strategy becomes committed to a cooperative partner, and if the partner has also adopted the same strategy they form a mutually committed relation. In all of these scenarios, it is social uncertainty (i.e., the risk of being exploited in social interactions) that drives people to form mutually committed, "safe" relationships.

HYPOTHESIS 2.—*The level of commitment formation among Japanese subjects will not be different from that among American subjects when the level of social uncertainty and trust are made equivalent in the two groups.*

The theory of trust proposed by Yamagishi and Yamagishi (1994) posits two major determinants of commitment formation. The first is the level of social uncertainty discussed above. The second is the level of the actor's general trust. People with a low level of general trust would prefer not to deal with anyone outside their established relations and thus tend to maintain committed relations at a higher level than do those having a higher level of general trust. The prediction concerning the effect of general trust, however, will not be tested in the first experiment; it will be tested in the second experiment. Instead, we matched Japanese and American subjects with respect to their levels of trust. Once these two factors (level of trust and amount of social uncertainty) are controlled, we have no theoretical reason to expect a cross-societal difference in the level of commitment formation, and thus we predict that the Japanese participants are not more likely to form committed relations than are the Americans.

METHOD

The experiment simulated transactions between buyers and sellers. Each experimental group consisted of several buyers and several sellers, but the subject (who was "randomly" assigned to the role of a buyer) was the only human subject in the group. The rest, including all sellers and buyers other than the subject, were actually programmed responses from the computer.

Subjects

Subjects were recruited from various classes at the University of Washington and at Hokkaido University. At the time of recruitment, at least a few weeks before the experiment, subjects were asked to fill out an eight-item trust scale developed by Yamagishi (1986, 1988*b,* 1988*c,* 1992). Potential subjects recruited into the subject pool were divided into the high-trust group and the low-trust group using a median split.[9] Equal numbers of high trusters and low trusters (50 each) were selected from the subject pool in each country. Although previous studies (Yamagishi 1988*b;* Yamagishi and Yamagishi 1989, 1994) consistently produced the result that Americans have a higher level of general trust than the Japanese, this cross-cultural difference in the level of general trust was removed as a possible factor by matching the subjects who participated in this experiment on trust levels. We originally planned to use subjects' levels of general trust as an additional factor, hoping to test the proposition that low trusters are more likely to form committed relations than are high trusters, but the data for the American subjects' individual trust scores were not recorded in such a way as to allow individual $\times$ individual linkage of scores to specific subjects. (This file was destroyed in data shipment.) The scores were available by condition because they were used to assign individuals to conditions, but they were not available by individual for subsequent analyses. Therefore, we know that the American and Japanese subjects are matched with regard to their trust scores by condition, but we cannot use trust as an independent factor in the analysis.

Five or six subjects were scheduled for each experimental session. When fewer than five subjects showed up for a session, confederates were brought into the laboratory to create the atmosphere that at least five or six subjects were participating. Although subjects were led to a private compartment as soon as they arrived at the laboratory and did not have

[9] Subjects whose trust scores were 28 or higher were classified as high trusters, and low trusters had trust scores of 20 or lower. The median trust score was 25.

a chance to meet other participants, the compartments were not well insulated and thus subjects could hear the experimenter talking to other participants.

Design

The manipulation of social uncertainty (low vs. high) was crossed with the subjects' nationality (United States vs. Japanese).

General Procedures

The experiment was conducted in 1993 in Japan and in 1994 in the United States. In each country, the experiment took place in a comparably designed social psychology laboratory complex consisting of several compartments for the subjects and a control room. Subjects were provided with relevant information displayed on a computer located in front of them in each compartment, and their responses were entered into the computer through the keyboard. The subjects' computers were networked to the host computer located in the control room. Subjects had no opportunity to meet the other participants in person before, during, or after the experiment.

Upon arrival at the laboratory complex, each subject was led to a compartment and was handed the first set of instructions. The instructions told them that participants play the role of either a buyer or a seller who repeatedly conduct transactions. The last part of the instructions asked the subject to hit a key on a computer keyboard to start "random assignment" of the role. While subjects were told that the role assignments would be random, only the role of "buyer" was assigned to them. The experimenter then came into the compartment, gave further instructions concerning how to read the information displayed on the subject's computer screen, answered questions, handed out the second set of instructions "for the buyer," and gave them $5.00 in cash.[10] The instructions for the buyer included the following information: (1) Buyers are expected to use their $5.00 in trading sessions, and profits or losses they experience during these trading sessions will be added to or subtracted from this fund (i.e., they will be paid the initial "capital" of $5.00 plus profits or minus losses at the end of the experiment). (2) The trades will be repeated many times (subjects were not informed of the total number of trials). (3) On each trial (or "trading session"), a buyer is matched with two sellers and has to buy

[10] Dollar figures in the experiments reported below should be translated to yen figures with the exchange rate of $1.00 for ¥200 (see n. 2 above).

a commodity from one of those two sellers. (4) Each seller is also matched with two buyers. Thus, when one of the sellers completes a deal with another buyer, the subject has to trade with the remaining seller. (5) One of the sellers (seller C) will be available throughout the experiment; the other seller (A) will be replaced by another seller (F) in the middle of the experiment. (6) Each trial or trading session starts with sellers announcing the prices of the commodity they are selling. Then, comparing sellers' offering prices, buyers must decide from which seller to buy. (7) When the quality of the commodity is standard, the experimenter buys the commodity for $1.40. The actual quality of the commodity sold by a particular seller may be above or below this standard. The quality of the commodity sold by the same seller may also vary from session to session. The seller is supposed to have some information about the quality of the commodity she is selling, but the information may not be very accurate. Thus, sometimes the commodity is overpriced or underpriced, and when that happens it is not clear if the pricing is intentional or not. The buyer resells the commodity she bought from a seller to the experimenter. The experimenter purchases the commodity from buyers at prices reflecting its true quality. Subjects make profits when their purchasing price is lower than the resale price (which accurately reflects the quality of the commodity); they suffer losses when the purchasing price is higher than the resale price. (8) After each trade, a roulette spins on the computer displays of the trading partners (since the sellers are computer responses, the roulette actually spins only on the buyer's display). When the roulette hits a "strike," the seller is given a chance to "extort" a predetermined amount of money from the buyer. When this happens, the seller decides whether or not to use this chance and "rob" the buyer. As trials proceed, the amount to be extorted increases.

After the instructions, subjects were given four practice sessions to get used to the computer display and the keyboard. The real experiment started after the practice sessions were over and all questions were answered. Subjects had two sellers to trade with (sellers A and C) during the first 20 sessions. The computer was programmed such that each of the two sellers would have the chance to extort money from the subject twice. The amount to be extorted from the buyer increased from $1.20 (sessions 1–7), to $1.90 (sessions 8–14), and to $2.60 (sessions 15–20). When given the chance to extort, seller A always used it, robbing the above amounts from the subject each time. In contrast, seller C never used the chance to exploit. In this way we made seller C a trustworthy partner. The offering prices did not systematically differ between the two sellers. Both made offers at prices randomly determined between $1.00 and $1.40 (uniform distribution). The resale price of those commodities were independently and randomly determined within the range of $1.30

and $1.50. Thus, subjects made profits on most of their trades although they suffered from extortion by A.

The "untrustworthy" seller A was replaced by another seller, F, after the twentieth session. For the rest of the experiment (sessions 21–30), the subjects had a different set of sellers to chose from, seller C (the trustworthy seller) and a new seller F with whom subjects had no prior experience. The new seller, F, made offers within the range of $1.00 and $1.25, undercutting the offering price of C on most trials. The experiment lasted for 30 sessions altogether. After the thirtieth trial was over, subjects were asked to fill out a postexperimental questionnaire, were given debriefing information, and were paid the amount they had earned in the experiment.

Manipulation of Social Uncertainty

Social uncertainty was manipulated by keeping or removing the "extortion" opportunities during the last 10 sessions (after the untrustworthy seller A was replaced by a new seller, F). In the low uncertainty condition, the roulette was removed from the subject's display and the subject was told that the sellers would no longer be given the chance to extort. In this condition, neither C (the trustworthy seller) nor F (the new seller) could extort from the subject. In the high uncertainty condition, on the other hand, the roulette and the chance to extort was not only kept during the last 10 sessions but the money to be extorted was increased to $4.00. However, the roulette never hit a "strike" during the last 10 sessions and neither A nor F was actually given a chance to extort from the subject. Thus, the two conditions were equivalent with respect to the actual behavior of A and C.

RESULTS

Manipulation Check

First, whether or not the uncertainty manipulation had the intended effect on subjects was examined by analyzing a postexperimental questionnaire item, "How strongly were you concerned with the possibility that your money might be taken away during roulette chances?" As expected, the main effect of uncertainty in a nationality × uncertainty analysis of variance (ANOVA) was significant ($F[1,193] = 4.66$; $P < .05$) and subjects in the high-uncertainty condition were more concerned ($M = 3.68$ on a 5-point scale; SD = 1.11) than were those in the low-uncertainty condition ($M = 3.36$; SD = 1.36). Second, seller A was evaluated by the subjects as less desirable than seller C (2.50 vs. 3.39 on a five-point semantic differential scale in which desirable = 5 and undesirable = 1; $t[196] = 5.27$;

$P < .001$). These results suggest that our experimental manipulations succeeded in creating the intended effects.

Hypothesis 1

The untrustworthy seller A was replaced by a new seller, F, after the twentieth session. The new seller was programmed to offer lower prices than C's price. The lower price provides an incentive for the subject to trade with F unless she is committed to C, the trustworthy seller. The frequency of sessions on which the subject bought from C instead of from F during the last 10 sessions is thus treated as an indicator of commitment formation by the subject with C. As predicted in hypothesis 1, subjects bought from C more frequently in the high-uncertainty condition (M = 6.70 sessions; SD = 2.67) than in the low-uncertainty condition (M = 4.77 sessions; SD = 2.36), and the main effect of social uncertainty in the uncertainty (subject's nationality analysis of variance was highly significant [$F(1,196) = 29.19$; $P < .0001$]). An analysis of postexperimental questionnaire items further confirms this result. Subjects were asked, "To what extent were the following considerations important to you in deciding on transactions during the experiment?" Possible answers were (1) keeping the same seller as a trade partner in order to develop a trusting relationship with him or her or (2) trading with a partner who can be trusted not to take away your money even when he or she gets an opportunity to do so. An analysis of the average of the subjects' responses (on a five-point scale) revealed a significant main effect of uncertainty ($F[1,193] = 4.19$; $P < .05$). Subjects felt the need to develop a trusting relationship with C more strongly in the high-uncertainty condition ($M = 4.11$; SD = 0.99) than in the low-uncertainty condition ($M = 3.81$; SD = 0.99). Hypothesis 1 is thus clearly supported by the results of this experiment as in Kollock's (1994) study (see fig. 1).

Hypothesis 2

The results indicate no difference in the degree of commitment formation with C between the two groups of subjects (5.85 sessions among Japanese subjects vs. 5.62 sessions among the Americans; $F[1,196] = 0.41$, NS). Furthermore, the effect of uncertainty did not vary significantly between the two groups as indicated by the weak, nonsignificant interaction effect in the above ANOVA ($F[1,196] = 0.85$, NS). In addition, neither the main effect of nationality ($F[1,193] = 0.01$, NS) nor the uncertainty × nationality interaction ($F[1,193] = 0.08$, NS) in the analysis of the postexperimental questionnaire items was significant. These results clearly support hypothesis 2.

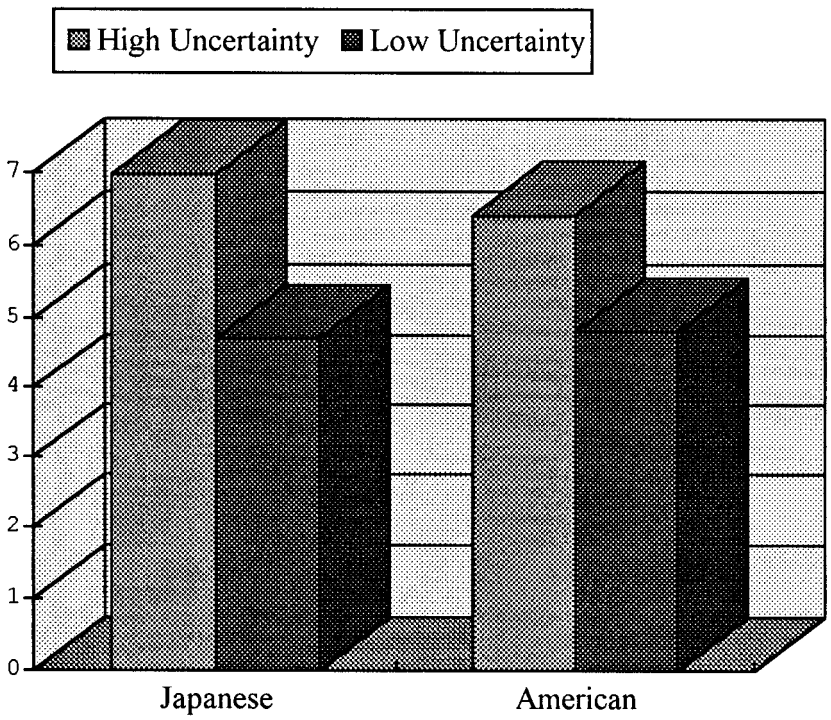

FIG. 1.—Commitment formation among Japanese and American subjects as a function of the level of social uncertainty.

EXPERIMENT 2

The results of the first experiment provide additional support for the proposition that social uncertainty facilitates commitment formation between particular exchange partners. The results further demonstrated that social uncertainty has comparable effects on commitment formation both among American subjects and Japanese subjects, at least in this experiment in which the two groups were matched on their levels of general trust. The purpose of the second experiment was (1) to replicate the effect of social uncertainty on commitment formation using a different experimental situation and to further enhance the generalizability of the proposition that social uncertainty facilitates commitment formation, (2) to test the other proposition critical to Yamagishi and Yamagishi's (1994) theory of trust, that low trusters, compared to high trusters, would be more strongly committed to a particular partner, and (3) to test the extent to which the above two propositions apply equally to American and Japanese subjects.

HYPOTHESIS 3.—*Low trusters will form committed relations more strongly than high trusters.*

HYPOTHESIS 4.—*The effect of general trust on commitment formation predicted in hypothesis 3 is stronger when the level of social uncertainty is high than when it is low.*

HYPOTHESIS 5.—*The effect of social uncertainty and trust on commitment formation predicted above will be comparable for the two groups of subjects.*

The second experiment was different from the first in the following respects. First, subjects' general trust was used as an experimental factor in this study. As mentioned earlier, American and Japanese subjects were matched with respect to their general trust levels in the first experiment, but trust level was not used as a factor in the data analysis due to the loss of the American subjects' individual trust scores in data shipment. Second, the experiment involved an abstract interdependent situation rather than the more concrete interdependence between sellers and buyers as used in the first experiment. Finally, two instead of one human subjects participated in each experimental group. Details concerning these procedural changes follow.

METHOD

Design and Subjects

The experiment involved a $2 \times 2 \times 2$ factorially crossed design (uncertainty = low vs. high; nationality of the subjects = American vs. Japanese; subject's level of general trust = low vs. high). All three factors are between-subjects factors. Subjects were recruited in a similar manner as in the first experiment. The subject pool in each country was divided into high trusters and low trusters at the median trust score (25 points) of the Japanese sample.[11] High trusters were those whose trust scores were 27 or higher; low trusters had trust scores of 23 or lower. From the Japanese subject pool, we drew 107 high trusters and the same number of low trusters; 100 American subjects from each trust level also participated in the experiment. However, a postexperimental analysis of the distribution of the subjects' trust scores revealed a systematic difference in the trust scores between the two countries; the American sample included a larger number of subjects whose trust scores were slightly below the cutting

[11] We used the median score of the Japanese sample for dividing the subject pool since the experiment was conducted in Japan before it was conducted in the United States and thus it was impossible to obtain the American median when the Japanese subject pool was divided.

score (i.e., below the Japanese median). This occurred since the population mean of the American pool was higher than the population mean of the Japanese pool (i.e., most Americans were high trusters according to the Japanese standard) and thus a majority of the low-trusting pool clustered slightly below the cutting score. We therefore decided to delete pairs in which at least one subject's trust score was only slightly below the cutting score (i.e., subjects with scores of 22 or 23) in order to make the American and Japanese subjects compatible on their trust scores.[12] This resulted in 186 Japanese (74 low trusters and 112 high trusters) and 141 American (42 low trusters and 99 high trusters) subjects.

General Procedures

The second experiment was conducted in 1994 in both Japan and the United States. As in the first experiment, subjects were led individually to a private room upon arrival and were handed a set of written instructions. They did not have the opportunity to see the other participants before, during, or after the experiment. They could sense the existence of other participants, however, due to the layout of the rooms. Although subjects were told that the experiment would be run in a group of several participants, each experimental group actually involved only two subjects. Two or more groups were run simultaneously to create the atmosphere that more than four subjects were in fact involved. When only one pair was run at a time, confederates were brought in to create the atmosphere of a larger group.

As in the first experiment, relevant information was displayed on the computer screen located in front of each subject, and the subjects entered their responses at the keyboard. Subjects' computers were controlled by the host computer located in the control room. The experiment consisted of 60 trials, but subjects were not informed of this. Subjects were asked to answer the postexperimental questionnaire, debriefed, and then paid for their participation. The whole experiment including instructions and the postexperimental questionnaire took about 80 minutes.

Subjects were each given \$5 (high-uncertainty condition) or \$3 (low-uncertainty condition) at the beginning of the experiment as "capital" to be used in the experiment.[13] The take-home pay for the subject was this initial endowment plus the profit gained or minus the loss incurred in the

[12] The subjects' behaviors within a group (actually a pair) were strongly interdependent so that pairs rather than individuals were used in the analysis.

[13] The amount of the initial endowment varied by the uncertainty condition, since the amount of profits to be earned in the experiment was expected to differ.

course of the experiment. Then, subjects performed five practice trials. The practice trials were programmed so that the subjects experienced all the possible cases described below. The experimental trials began after all the questions following the practice trials were answered. On each trial, the subject dealt with either a human participant or the computer. On the trial in which the subject dealt with the computer, she received an amount of money randomly determined within the range of 12¢ (or yen) and 27¢ (or yen) on the roulette displayed on the subject's computer screen. On the trial in which the subject interacted with another human participant, the two partners were each given 10¢. Then, one of the two was randomly selected for a chance to appropriate the partner's 10¢. If the one who was randomly selected used the option, she earned 20¢, and the partner's earnings on that trial were zero. If she did not use the option, each earned 10¢.

Whether the subject was to deal with the computer or with a human on the first trial was randomly determined with equal probability. (The subject was told that the assignment was random, but was not informed of the probability.) Since only two human subjects were included in each group, the assignments were synchronized. When they were assigned to interact with a human participant, they interacted with the same person. However, they were made to believe that at least four participants were involved and that the probability of interacting with the same person on the next interaction was small.

From the second trial on, whether the subject dealt with the computer or with a human participant was determined in the following manner. When the subject dealt with the computer on the previous trial, it was determined in the same manner as in the first trial. When the subject dealt with a human on the previous trial, the subject and the partner (actually the only two human subjects) were each given the choice of interacting with the same partner. If the two chose to interact with the partner from the previous trial, the two did in fact interact with each other on the new trial. If this happened, each was given 10¢ and one of the two was given a chance to appropriate the partner's money. When at least one of the two declined to interact with the same partner, then both faced the same situation as on the first trial. Each was randomly assigned to deal with the computer or to interact with a human participant. Since only two human subjects participated in each group, the same pair was formed every time the subject was assigned to interact with a human participant. However, subjects were made to believe that they might be matched with any one of several participants. Thus, the choice for the subject was interacting with the same partner or taking the chance of dealing with a computer (a sure gain of 12¢–27¢) or a "new partner."

Manipulation of Social Uncertainty

Social uncertainty in the current context is the expected loss caused by the self-serving behavior of the partner, which is a product of the probability of expected loss and the size of the expected loss. In the first experiment (as well as in Kollock's experiment), social uncertainty was manipulated by varying the probability of a loss being imposed. In the second experiment, however, social uncertainty was manipulated by varying the second component of the expected loss, that is, the size of the expected loss. This design change was introduced in order to test the generalizability of the previous findings concerning the effects of social uncertainty. We hoped to test the notion that the predicted effects of social uncertainty would occur whichever component of the expected loss (the probability estimate or the size of the loss) is used to manipulate social uncertainty. In the low-uncertainty condition, the loss caused by the partner's self-serving behavior (i.e., appropriation of the subject's money by the partner) is limited to 10¢. In the high-uncertainty condition, an extra loss of 50¢ was imposed in addition to the original 10¢ when the subject's partner used the appropriation option. The extra loss of 50¢ was explained to the subject as similar to the cost of a broken car window caused by the theft of a car stereo.

Opportunity Costs

The emancipation effect of trust presumed in the theory requires the existence of opportunity costs. The level of opportunity costs (i.e., the potential profits that could be obtained outside of the committed relationship, or the difference between the comparison level for the alternative (CL_{alt}) and the comparison level for the current relationship (CL; see Thibaut and Kelley 1959) was set at a fairly high level in both uncertainty conditions. In a commitment relationship in which both partners refrain from using the appropriation chance, the subject earns 10¢ per trial. By choosing to interact with the same partner who has proven to be cooperative (not using the appropriation chance) in the past, the subject can expect a fairly sure 10¢. By leaving the security of the committed relationship, however, the subject is given a chance to deal with the computer, which gives a minimum of 12¢ and a maximum of 27¢. The difference between the sure 10¢ and the expected gain of 19.5¢ from the computer is the opportunity cost used in this experiment. In this situation involving an opportunity cost, high trusters who expect that most other participants will not use the appropriation chance even in a new encounter will be tempted to leave the committed relationship in search of a chance to meet the more lucrative partner (in this case, the computer). On the other hand, low trusters who expect that most other participants will use the appropriation chance

in a new encounter will hesitate to leave the already established security of a committed relationship in which the chance of getting duped is minimal.

RESULTS

Except for the results from questionnaire responses, all analyses use pairs as the statistical unit of analysis due to the interdependence of the behavioral responses of the subjects who participated in the study in dyads.

Manipulation Check

Subjects' responses to a postexperimental question—How strongly were you concerned with the possibility that your money would be taken away when the partner received a 'chance'?—were used to see if the manipulation of social uncertainty had the intended impact on the subjects. The main effect of social uncertainty in a nationality × uncertainty × trust ANOVA was highly significant ($F[1,320] = 10.14$; $P < .01$) proving the validity of the manipulation. Subjects in the high-uncertainty condition ($M = 3.37$; SD = 1.13 on a five-point scale) were more concerned with the possibility of getting duped by the partner than were those in the low-uncertainty condition ($M = 2.94$; SD = 1.28). The only other effect that was statistically significant was the main effect of trust ($F[1,320] = 17.48$; $P < .01$) indicating that low trusters ($M = 3.47$; SD = 1.27) were more concerned than were high trusters ($M = 2.96$; SD = 1.16). The main effect of trust is a testimony to the predictive validity of the trust scale used in the assignment of subjects.

Utilization of the Appropriation Chances

Before engaging in hypothesis testing, let us briefly present a descriptive overview of how subjects used the appropriation chances available to them. The overall relative frequency of the trials during which subjects who were given the appropriation chance actually did use it was .51 (SD = .31). That is, subjects in this experiment engaged in exploitative behavior about half of the time they were given the opportunity to do so. In a nationality uncertainty × trust ANOVA, the main effect of uncertainty ($F[1,156] = 55.37$; $P < .0001$) was significant. Subjects' exploitative behavior was much more frequent in the low-uncertainty condition ($M = .67$; SD = .27) than in the high-uncertainty condition ($M = .33$; SD = .30). This effect of social uncertainty suggests that subjects who saw the consequence of their exploitative behavior as more serious to the partner (involving the extra loss of 50¢) refrained from engaging in such behavior. Although this might seem to weaken the manipulation of social uncer-

tainty, the result of the manipulation check presented above indicates that the manipulation of social uncertainty was strong enough despite the fact that subjects in the high-uncertainty condition refrained from engaging in exploitative behavior. No other effects were significant.

Hypothesis 1

The degree of commitment formation in this analysis is measured as the probability that an existing pair of traders on one trial is maintained on the next trial. (It is a measure of repeat interactions.) As predicted in hypothesis 1, subjects in the high-uncertainty condition ($M = .30$; SD = .27) formed committed relationships (in which they kept interacting with the same partner) more frequently than did those in the low-uncertainty condition ($M = .19$; SD = .18), and the difference was highly significant in a nationality × uncertainty × trust ANOVA ($F[1,156] = .83$; $P < .001$).[14] Furthermore, the commitment intention index confirms the same pattern. In this analysis, a commitment intention index was calculated for each individual by dividing the number of trials in which a subject chose to interact with the same partner and did not act exploitatively by the number of trials in which the subject was given a chance to keep interacting with the same partner. The main effect of social uncertainty was again significant ($F[1,156] = 18.11$; $P < .0001$) subjects wanted to interact with the same partner who had not used the appropriation chance more strongly in the high-uncertainty condition ($M = .48$; SD = .24) than in the low-uncertainty condition ($M = .36$; SD = .15). Finally, subjects in the high uncertainty condition revealed a preference for maintaining committed relations on all of the five relevant questions:

1. How important was it during the experiment to continue trading with the same partner? ($F[1,320] = 11.01$; $P < .001$)
2. Did you think that dealing with the same partner was advantageous insofar as the partner did not use the 'chance'? ($F[1,320] = 21.99$; $P < .0001$)
3. How important was it for you to act in a way to improve the chance of being chosen by the same partner continuously? ($F[1,320] = 11.25$; $P < .001$)
4. How strongly did you try to trade with the same partner in order to build a trusting relationship? ($F[1,320] = 27.12$; $P < .0001$)

[14] The distribution of the commitment index is highly skewed as is shown in the comparison of the mean and the standard deviation. Thus, the same analysis was conducted with a square root transformation. The results were similar to the original analysis ($F[1,156] = 6.13$; $P < .05$).

5. How strongly did you wish to trade with a person who would not utilize the 'chance'? ($F[1,320] = 33.$; $P < .0001$)

These results clearly support the hypothesis that social uncertainty facilitates commitment formation between particular exchange partners.

Hypothesis 2

As predicted, nationality of the subjects did not have a main effect ($F[1,156] = 2.44$; NS) on commitment formation ($F[1,156] = 2.00$; NS) or on commitment intention, replicating the results of the first experiment.

Hypothesis 3

As predicted in hypothesis 3, low trusters ($M = .27$; SD = .24) formed committed relationships more frequently than did high trusters ($M = .23$; SD = .23). The main effect of trust in a nationality × uncertainty × trust ANOVA analysis of the pairwise index of commitment formation was significant with the original data ($F[1,156] = 3.99$; $P < .05$) and with the square root transformation ($F[1,156] = 4.80$; $P < .05$). The same pattern was observed with the commitment intention index, but the main effect did not reach the significance level ($F[1,156] = .56$; NS).

Hypothesis 4

The predicted uncertainty × trust interaction did not reach the significance level in the analysis of the pairwise index of commitment ($F[1,156] = 1.84$, NS, with the original data; $F[1,156] = 1.39$, NS, with the transformed data). The commitment intention index data reveal a marginal effect of the uncertainty × trust interaction ($F[1,156] = 3.01$; $P < .09$). The pattern of the interaction shown in figure 2 is consistent with the hypothesis, both with the pairwise data and the individual-level data. Furthermore, analyses of simple main effects of trust in the two uncertainty conditions show that trust has a significant effect in the high-uncertainty condition ($F[1,156] = 4.76$; $P < .05$, with the pairwise original data; $F[1, 156] = 4.81$; $P < .05$, with the transformed data; $F[1,156] = 2.65$; $P < .11$, with the individual-level data), but not in the low-uncertainty condition ($F[1,156] = 0.25$, NS, with the pairwise original data; $F[1,156] = 0.63$, NS, with the transformed data; $F[1,156] = 0.57$, NS, with the individual-level data). These results provide additional support for hypothesis 4.

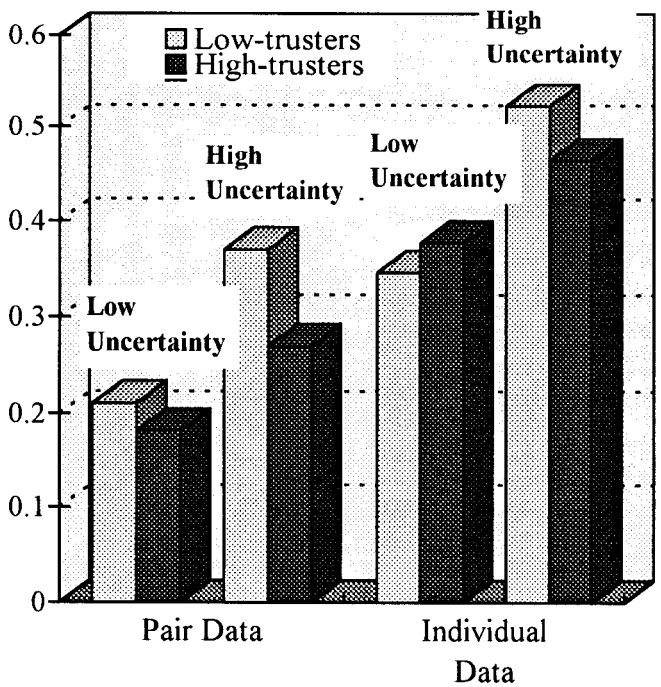

FIG. 2.—The degree of commitment formation and the strength of intentions to form a commitment relationship in experiment 2.

Hypothesis 5

As predicted, neither uncertainty nor trust significantly interacted with nationality in the nationality × uncertainty × trust ANOVA of commitment formation (F[1,156] for the nationality × uncertainty interaction = 1.75, NS; F[1,156] for the nationality × trust interaction = 0.06, NS) or for commitment intention (F[1,156] for the nationality × uncertainty interaction = 0.33, NS; F[1,156] for the nationality × trust interaction = 0.23, NS).[15]

CONCLUSION

The results of the experiments provide support for the two major propositions in the "emancipation" theory of trust. First, the proposition that social uncertainty promotes commitment formation was consistently sup-

[15] Analysis with the transformed data also confirmed this conclusion.

ported in both experiments. Considering the substantial differences in the experimental design between our two experiments and between the current experiments and Kollock's (1994) experiment, it would be safe to conclude that support for this proposition is fairly robust. Commitment formation is a readily available and commonly used response among people facing socially uncertain situations, and the tendency to form stable relations with specific partners increases as the level of social uncertainty increases. In the first experiment, the level of social uncertainty was manipulated via a change in the likelihood of facing a risky situation in social interactions. In the second experiment, it was manipulated via a change in the potential loss caused by exploitative behavior of the interaction partner. The fact that the predicted effect emerged in both experiments provides a basis to argue for the validity of defining social uncertainty in this manner, that is, as the expected loss caused by an untrustworthy partner. Furthermore, social uncertainty had similar effects among American subjects and Japanese subjects in both experiments. This is consistent with the institutional view of culture discussed in the introduction. According to the widely shared view that characterizes Japanese culture as "collectivist," it is the "mind" of the Japanese people that makes them go along with the group. The results of these two experiments, however, demonstrate that once the relevant variables—degree of social uncertainty and the level of general trust—are controlled, American and Japanese subjects do not exhibit differences in their tendencies to voluntarily form committed relationships.

The second proposition that received experimental support is that the level of general trust is negatively related to the individual's tendency to form a stable relationship with a particular partner. Again, the predicted effect of general trust on commitment formation was not different among Americans and the Japanese. An additional proposition that the effect of trust would be stronger when the level of social uncertainty is high than when it is low also received experimental support, although the support was not as strong as it was for the other two propositions.

These results, taken together, provide further empirical support for the theory of trust proposed by Yamagishi and Yamagishi (1994). The theory emphasizes the role of general trust (trust in others in general) as an emancipator of people from the confines of safe but closed relationships. When a society as a whole is characterized by closed relations (as typically observed in collectivist societies), the one who is "emancipated" from a closed relation cannot find a better interaction partner since all the other relations are closed to "outsiders." The Japanese employment system among major companies for the past few decades is one of the best examples of such a "collectivist" society, although the situation is rapidly changing. Employment opportunities were almost completely closed to those making midlife

career changes, and thus opportunity costs for the employees of major companies were minimal. In such an environment developing a high level of general trust and becoming "emancipated" from the confines of established relations brings virtually no positive outcomes. Being highly trustful, expecting benign treatment from "strangers," in such an environment makes a person unrealistically optimistic. In contrast to this, we can think of a society in which better opportunities are abundant outside of the established relations. The American employment scene is closer to this ideal-type than to the previously presented collectivist ideal-type. Having a high level of general trust and not staying in the established relations despite better outside opportunities can have positive consequences in such an environment. Yamagishi and Yamagishi (1994) derived the hypothesis that Americans would have a higher level of general trust than the Japanese based on this reasoning and confirmed this hypothesis with survey data from a cross-societal questionnaire. The findings reported here provide support of a different kind—based on experimental methodology rather than survey research—and thus add to the validity of the theory.

The only anomaly observed in the data is the unexpected effect of the subject's nationality on the frequency of exploitative behavior. American and Japanese subjects were not different from each other in their tendencies to form committed relations, as expected. On the other hand, Japanese subjects showed a stronger tendency to behave exploitatively than did American subjects. Although this difference had not been predicted before the experiment, it is consistent with the institutional view of culture that underlies the current study. According to this view of Japanese society (Benedict 1946; Hechter and Kanazawa 1993; Yamagishi 1988*a,* 1988*b*), it is informal mutual monitoring and sanctioning rather than internalized moral values that insure that the Japanese will cooperate in achieving group goals. Yamagishi's (1988*b*) cross-societal experiment shows that once opportunities for monitoring and sanctioning are removed, the Japanese are in fact less cooperative in achieving group goals than are Americans. The experimental situation used in the current experiment resembles the one used in Yamagishi's (1988*b*) social dilemma experiment in this respect, and it is no wonder why the Japanese acted less cooperatively or more exploitatively than did the Americans.

The finding that nationality of the subjects did not play a major role in determining the level of commitment formation requires special attention. This finding suggests that cross-societal experimentation can be a powerful tool for exploring what have been relegated to the category of general "cultural differences." In this study, we started with a theoretical prediction that the level of commitment formation between particular partners is determined by the levels of social uncertainty and opportunity costs in

the environment and the level of general trust of the partners. The "cultural difference" that Japanese tend to form stable, long-term relations between particular partners or within particular groups should thus disappear once these three factors are experimentally controlled. And, this is exactly what happened in the two experiments reported above. If we still find a "cultural difference" even after experimentally controlling for the theoretically relevant variables, then we are further encouraged to look more deeply into the aspects of culture that are responsible for the "residual" differences. If we do not, then we do not need to revert to culture to explain the existing "cultural" differences. In brief, the goal of cross-societal experimentation is to demonstrate that "cultural" differences can be investigated more fully by experimentally controlling or manipulating the theoretically relevant variables. This is a different use of experimentation than is typical in cross-cultural experimentation, in which the primary goal is to demonstrate that cultural differences do exist; for example, to show that the Japanese act in a different manner than Americans do.

Finally, let us comment on the nature of the samples used in the experiment. It is clear that our samples do not represent any well-defined population within each society. This is a "problem" common to most experimental studies since it is practically impossible to bring a random sample drawn from a large population into the laboratory. What we have to keep in mind, however, is that experimental findings are not intended to be generalized beyond the laboratory in the descriptive sense. That is, descriptive generalization is not the purpose of theoretically informed experimental work. Instead, the goal of an such experimentation is theory testing. If a theory is disproved with a particular sample that is not representative of any specific population, the result at least tells us that there is an important set of hidden variables involved that interacts with the theoretical variables under study. This allows us to improve the theory. With experimental research, the critical kind of generalization is generalization of the theory or the specification of relevant variables that potentially interact with the primary theoretical variables, not generalization of the particular findings per se. For this purpose, replications with different experimental manipulations and situations are critical. We have demonstrated the generalizability of the propositions derived from Yamagishi and Yamagishi's (1994) theory of trust beyond one particular experimental setting.

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