Knowledge about Others Promotes Outlook of Future Interaction via Ease of Prediction*

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This study investigated the role that knowledge about others plays in forming expectations about future interaction with them, by affecting the difficulty of imagining their possible thoughts and behaviors. Participants were given knowledge about targets, which was manipulated in two ways: whether it was informative about the targets, and whether it was applicable to the subsequent task imagining targets' reactions in various situations. Having knowledge useful in imagining targets' reactions had a positive effect on outlook of future interaction with the targets, and this effect was partly mediated by the difficulty experienced while imagining the reactions. The data also suggested that when participants had no informative knowledge about the targets, they applied knowledge about others that was available to them.

Keywords: imagination, prediction, interaction, difficulty, metacognition, fluency

Interacting with people one has had little contact with can be a difficult experience. Because of uncertainties about what will happen during the interaction, one may feel anxiety and have low expectations about outcomes of the interaction, which may interfere with communication effectiveness (Gudykunst, 1995). One may even decide to avoid the potential interaction partners altogether if the apprehensions and low expectations outweigh possible gains of the interaction. However, if knowledge about the potential interaction partners is available (acquired either by direct observation or indirectly from others), it may be easier to predict how they would think and behave, so that one may feel more confident and positive about the interaction. It is meaningful to explore what kind of knowledge is

effective in improving one's expectations about interactions with potential interaction partners, as well as to investigate the exact process of how such expectations are formed, in order to deal with social anxiety (Schlenker & Leary, 1982), and to encourage interactions between people from different social groups (Allport, 1954/1979; Stephan & Stephan, 1985).

Previous research, especially in the context of intergroup interaction, stressed the role of knowledge about others in forming expectations about interactions with them. Stephan and Stephan (1985) argued that one reason people feel anxiety in intergroup interaction is that they are ignorant of each other's culture, including shared values and norms. Similarly, Britt, Boniecki, Vescio, Biernat, and Brown (1996) listed lack of knowledge about the outgroup as one of the determinants of individual differences in intergroup anxiety. According to Anxiety/Uncertainty Management Theory, as experience with the outgroup increases, one feels less uncertain and anxious (Hubbert, Gudykunst, & Guerrero, 1999), because one acquires knowledge about the outgroup, learns specific norms and scripts about interacting with the outgroup, and also finds out that outgroup members are not dissimilar from members of one's own group (Hammer, Wiseman, Rasmussen, & Bruschke, 1998).

However, there have been few attempts to directly test the effects of knowledge on expectations about interactions by manipulating the content (or lack) of knowledge. Rather, in most empirical studies (e.g., Hubbert et al., 1999; Stephan & Stephan, 1992; Islam & Hewstone, 1993), researchers explored the effects of contact on one's attitudes regarding interacting with targets. Although this kind of design can show how actual contact can change expectations about future interactions in real-life settings, an experimental procedure with tight control over the content of knowledge is necessary to fully examine the specific cognitive mechanism that involves knowledge and its effects on outlook of future interaction. In the current study, the hypothesis that knowledge about potential interaction partners influences outlook of future interaction with them was tested. More specifically, this effect was expected to be mediated by difficulty experienced in imagining their possible thoughts and behaviors. The content of knowledge provided to participants was manipulated, and relationship between subjective experience of difficulty and outlook of future interaction was examined. Thus, this study aimed to offer an explanation of the psychological mechanism through which contact and knowledge acquisition leads to more positive expectations about future interaction.

Research on metacognition of fluency (for recent reviews, see Schwarz, 2004; Alter & Oppenheimer, 2009) provides a theoretical framework for relating knowledge about people to anticipations about interacting with them. According to Schwarz (2004), subjective feelings of ease or difficulty of mentally processing information (i.e., fluency) can affect judgments related to the object in question in unexpected ways. For example, Reber and Schwarz (1999) had participants judge whether statements were true (e.g., "Osorno is in Chile", "Lima is in Peru.") while manipulating the visual fluency of the statements by having some of them in easier to read colors than others. It turned out that when statements were visually more fluent, they were more likely to be judged as being truthful. Applying the concept of fluency to the context of social interaction, if processing information regarding a social target is felt to be difficult (i.e., less fluent) for some reason, the difficulty may be attributed to some internal characteristics of the target, and as a consequence, interaction with the target may be expected to be more difficult than when such

difficulties are not experienced. In another example that is more pertinent to the present research question, Mandel, Petrova, and Cialdini (2006) examined the effect of imagination fluency in the context of consumer psychology. They manipulated the difficulty of imagery regarding participants' own financial success (e..g, by varying the college major of the comparison target or inserting distracting numbers in the description), and observed that when imagining their success is made more difficult, participants would have lower expectations about their future wealth; moreover, this effect was partly explained by self-reported difficulty of imagination.

Recently, Park (2011) demonstrated the significance of cognitive fluency of imagination in expectations about interaction. In the first study, participants imagined possible reactions of targets in various social situations, and the situations were manipulated so that situations in one condition were inherently more difficult to imagine reactions in (e.g., "Chris wants to call his friend but accidentally dials his ex-girlfriend. What would Chris say?") than their counterparts in the other condition (e.g., "Chris wants to call his friend but accidentally dials one of his brothers. What would Chris say?"). As expected, participants in the condition with more difficult conditions had a more negative overlook of future interaction with the targets, and this difference was partly explained by the perceived difficulty of imagining the reactions. In the second study, when attribution of the difficulty to the targets was prevented (with an explicit statement that the apparent association between the targets and the situations is arbitrary), participants were less likely to form negative outlook of future interaction.

Based on these recent advances, it is plausible that knowledge about target people can similarly enhance the metacognition of fluency and influence subsequent judgments about them (i.e., expectations about future interactions with them): If one knows something about a target that can be recruited in imagining what the target would do or think, it may make the imagining process felt easier, and this feeling of ease may be attributed to the target so that interacting with the person will be anticipated in a more positive light. Importantly, this effect of fluency on judgment does not require that the valence of imagination itself be positive: Regardless of whether one imagines the targets reacting in a positive or negative way, the ease or difficulty of imagining can have an independent influence on judgments about the targets. Also, in contrast to previous research on fluency, in which the source of ease or difficulty was typically not attributable to the object of judgment itself (e.g., Reber & Schwarz, 1999), in this case, the source of metacognitive experience (i.e., performance in the imagination task) is largely determined by something about the object (i.e., knowledge about the target). Therefore, it can be conjectured that the subjective experience will be more readily (and legitimately) attributed to the target.

To summarize, the current study aims to address this research question: When knowledge about the targets (potential interaction partners) is available, and the knowledge is applied in imagining the targets' reactions, will people have more positive outlook of future interaction with them? Lack of knowledge and its consequences can be considered at two different levels. First, the case may be that one does have knowledge about the target, but that the knowledge is not applicable to the given task of imagination. For example, if one knows only that David is friendly, one cannot make a meaningful prediction about what David would do in a morally dilemmatic situation. In such a case, imagining David's reactions will be felt as difficult (i.e., less fluency will be experienced), and such an experience

may adversely affect one's expectations about interacting with him. Second, one may not have any meaningful knowledge about the target at all. There are at least two possible consequences in such a case. One may simply feel difficulty in imagining the target's reactions, and form negative outlook of future interaction, as in the case discussed above. Or, one may use knowledge about some other people that is readily available. For example, Ames (2004) demonstrated that people often employ representations of themselves or of social stereotypes when imagining targets' possible reactions, depending on the perceived similarity of the targets to themselves or to stereotypes. If one would use available knowledge about those other than the targets, the imagination process will not be felt as difficult as when no knowledge is available for use, and likewise one's outlook of future interaction will be less adversely affected by the lack of knowledge.

In this study, participants first acquired knowledge about members of a hypothetical group, by reading self-descriptions by the members of the group. After that, they made predictions about possible reactions of other members of the same group in various social situations, and reported how difficult it was to make the predictions. All participants then reported their outlook of future interaction with other members of the target group. Relevance of knowledge to the prediction task was manipulated across three conditions, using the self-descriptions as well as the situations used in the prediction task. In two conditions, the descriptions were indicative of personality traits shared by members of the group, but the knowledge was either applicable (in *Knowledge Applicable* condition) or inapplicable (in Knowledge Inapplicable condition) to the situations about which predictions are made. In the third (Knowledge Uninformative) condition, the descriptions did not reveal any personality

characteristics of the targets, so that participants had to imagine their possible reactions without any knowledge about their personalities.

It was expected that, first, participants who were able to apply the personality knowledge they acquired about the targets (because the knowledge is relevant to the prediction situations) would be more likely to feel that they know those people, compared to participants who were not able to do so. Participants who were not provided with any personality knowledge about the targets would be the least likely to feel that they know the targets.

More importantly, in terms of perceived difficulty of imagination and outlook of future interaction with the targets, two sets of predictions were made that correspond to the two pairs of comparisons. Between Knowledge Applicable and Inapplicable conditions, participants in the Knowledge Applicable condition were expected to experience less difficulty imagining the targets' reactions, and have more positive outlook of future interaction. Moreover, following the theoretical model and replicating Park (2011), the effect of manipulation (i.e., applicability of knowledge) on outlook of future interaction was expected to be mediated by perceived difficulty.

Comparison between Knowledge Inapplicable and Uninformative conditions was more exploratory, as per the different possibilities discussed above. If participants in the Knowledge Uninformative condition are unable to recruit any knowledge to make predictions about the targets, they would feel as much difficulty as those in the Knowledge Inapplicable condition would, and have comparable degree of (negative) outlook of future interaction as a result. On the other hand, if they apply knowledge that was not provided in the study — such as knowledge about themselves (Ames, 2004) or a generic prototype (Karniol, 2003) — they may actually find the prediction task easier than those in

the Knowledge Inapplicable condition would, and therefore also have a more positive outlook of future interaction.

Method

Participants and Overview of Study

Participants were 94 undergraduate students (56 females) taking psychology courses in a public university in the U.S. participating for course credit (age M = 19.81, SD = 1.38). Thirty one of them (33.0%) identified themselves as White/Caucasians (18 females), 28 as East Asians (15 females), and the rest as other ethnicities including Southeast Asians, Latinos/Latinas, African Americans, and others (23 females). Participants were randomly assigned to one of three conditions: one in which knowledge about the group was helpful in prediction (the Knowledge Applicable condition), one in which it was not helpful in prediction (the Knowledge Inapplicable condition), and lastly, one in which the provided knowledge was not informative about the targets (the Knowledge Uninformative condition). Participants in the Knowledge Applicable and Inapplicable conditions read descriptions about the target group members indicating two shared personality traits ('perfectionistic' and 'thrifty'), while participants in the Knowledge Uninformative condition read descriptions of events in the target group members' lives that are not suggestive of any personality traits. Later, participants in the Knowledge Applicable condition imagined the possible reactions (thoughts and verbal behaviors) of other members of the target group in situations relevant to the traits of 'perfectionistic' and 'thrifty'; situations presented in the other two conditions were relevant to two other, unrelated traits ('soft-hearted' and 'defiant'), so that the knowledge they had been

given would not be helpful in the prediction task. The cell sizes were roughly equal: 32 in Knowledge Applicable condition, and 31 each in the other two conditions.

Descriptions of Target Group Members

In the learning phase, participants were first told that they were going to get to know several individuals who are members of a social group. Members of a hypothetical group was used as targets as opposed to a single individual, because of the possibility that participants may find it strange to read descriptions about a single target's behaviors implying the same traits repeatedly. The group was described as highly entitative, with the description developed by Crawford, Sherman, and Hamilton (2002), i.e., "People in this group are all close friends, and they are similar in various aspects including their backgrounds, personalities, and beliefs. This group is considered to be very close and cohesive." The purpose of this description was to make the individuals in the group be perceived as sharing personality traits.

Participants then read descriptions about 14 members of the group. Each description took the form of direct quote made by a group member describing him/herself, following the name of the individual. The descriptions appeared on the screen sequentially. The descriptions were presented in random order. In Knowledge Applicable and Inapplicable conditions, seven self-descriptions each were given for the traits of 'perfectionistic' and 'thrifty'. These traits were selected from a list of personality traits compiled by Dumas, Johnson, and Lynch (2002) based on the following criteria: a) The traits should be moderately valenced, so that on average the group as a whole would give a neutral impression (likableness scores of the selected traits

were within 1 standard deviation range around midpoint); b) it should be possible to generate self-descriptions—as well as specific thoughts and behaviors expected in diverse situations—that are indicative of the traits (e.g., traits such as 'average', 'wordy', or 'athletic' are not good candidates); and c) the traits should be attributable to groups (e.g., traits such as 'lucky' are not typically shared within a group and thus are not suitable). Examples of self-descriptions include: "Albert: 'Whenever I write a paper, I re-read it over and over again to make sure there are absolutely no mistakes.'", and "Jessica: 'Today I bought a fairly new dining table and some furniture for really cheap at a garage sale down the street.'"[1] In the Knowledge Uninformative condition, 14 filler sentences were given instead which contained little information about the targets' characters but rather described random everyday events or personal facts, such as "Ed: 'I was supposed to have a meeting today at 11am. But when I got to work and checked my email, I found out that the meeting was cancelled due to some scheduling conflicts.'", and "Cindy: 'I have a sister who just graduated from college. After taking a year off, she plans to go to grad school.'"

Materials

Prediction Task.

In the prediction task, participants imagined possible thoughts and verbal behaviors of the target group members in response to a series of social situations. The targets were different from those presented in the learning phase. Participants were asked to take the time and picture each situation and the imagined reaction of each person in mind as vividly and in detail as possible.

In the Knowledge Applicable condition, the situations were those that pertained to the traits 'thrifty' (e.g., "Jack is out shopping with friends. One of his friends tells him that he should spend more money on himself. What would Jack say?") and 'perfectionistic' (e.g., "Frances is invited to a potluck party. She decides to make a dessert but it doesn't turn out to be as good as she expected. What would Frances think?"), i.e., the traits that were used in the group description. In the other two (Knowledge Inapplicable and Uninformative) conditions, the situations pertained to the trait dimensions of 'soft-hearted' ("Jack is at the store. He notices a child crying alone in one of the aisles. What would Jack say?") and 'defiant' ("e.g., Frances is staying at home for summer. Her father has a luxury car he just bought, and he specifically tells her not to drive it. What would Frances think?"). Thus, participants in these two conditions had to make predictions about the group members, without having any knowledge about the group applicable to the given situations (in the Knowledge Inapplicable condition), or without having any knowledge about the group at all (in the Knowledge Uninformative condition). These two traits were selected because

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1) There was a problem concerning the two personality traits used in Knowledge Applicable and Inapplicable conditions that had not been anticipated at the design stage. Even though the two traits were selected based on valence so that the overall impression of the targets would be neutral, it was possible that juxtaposing the traits of being perfectionistic and thrifty would render the targets perceived in a negative light (e.g., as being uptight). According to the hypothesis, participants in the Knowledge Applicable condition would more strongly feel that they know the targets than would those in the Knowledge Inapplicable condition, and would also have more positive outlook of future interaction. But if the targets were perceived negatively, it was possible that those who feel they know the target group more strongly would also be more likely to perceive them negatively. This possibility is examined and statistically addressed in Results section.

they were also moderately valenced on Dumas et al.'s (2002) list. Trials were presented in random order.

Questionnaire.

All questionnaires items were rated on a 7-point scale. Table 1 lists internal consistency values and exemplar items of the measures used.

Perceived Difficulty.

Participants were first asked about their Perceived Difficulty of prediction task, with 5 items.

Outlook of future interaction.

Outlook of future interaction was calculated as a composite score of three subconstructs, namely *Anticipated Anxiety* in future interaction, Expected Quality of future interaction, and Intention to Avoid future interaction. Each of these subconstructs was measured using scales adapted from previous research on apprehensions of intergroup interaction. First, Anticipated Anxiety questions (10 items) measured how much participants anticipated experiencing each of ten positive and negative emotions if they would interact with the target

group members (Stephan & Stephan, 1985; Plant & Devine, 2003). For the measures of Expected Quality (10 items), participants rated their expectations about how interactions with the target group members would unfold (Duck, Rutt, Hurst, & Strejc, 1991; Gudykunst & Shapiro, 1996). Intention to Avoid scale (5 items) tapped participants' willingness to avoid future interactions with the target group members (Plant & Devine, 2003). After reverse-scoring Anticipated Anxiety and Intention to Avoid, the three measures were averaged to yield the score of Future Outlook.

Perceived Knowledge.

Participants were also asked about their *Perceived Knowledge* with two items (e.g., "How much do you feel you know about their personality characteristics?", bivariate correlation $r = .84$, $p < .01$). It was measured to explore how learning about the targets and making predictions jointly affect how much one feels one knows them.

Open-ended description.

Lastly, participants were given an open-ended question that asked them to describe the group; this

Table 1. Internal consistency (Cronbach's Alpha) values and exemplar items for questionnaire measures

	α	Exemplar items
Perceived Difficulty	.74	How difficult was it to generate the sentences?
		How vague or vivid were the imagined reactions in your mind?
Anticipated Anxiety	.93	How strongly do or agree or disagree with the following statement?
		"I would feel careful when interacting with a member of this group."
		"I would feel anxious when interacting with a member of this group."
Expected Quality	.92	When interacting with a member of this group, how in-depth or superficial do you expect your interaction will be?
		To what extent will your expectations of a member of this group and your communication with him or her unfavorable or favorable?
Intention to Avoid	.95	How strongly do or agree or disagree with the following statement?
		"If I can avoid interacting with the physically disabled, I will."
		"I would look forward to interacting with members of this group."

was given to verify that participants in Knowledge Applicable and Inapplicable conditions formed impressions of the targets that pertained to the two personality traits of 'thrifty' and 'perfectionistic'. The group descriptions that participants in these two conditions wrote were examined to check whether they correctly formed impressions of the group members as thrifty and perfectionistic. Most participants (43 out of 63, or 68.2%) described the group in terms of both of these two traits. Since it was important for participants to have perceived the group as having these two traits, data from participants whose descriptions did not include at least one of the two traits were removed; these resulted in loss of data from 3 participants in the Knowledge Applicable condition, and from 4 in the Knowledge Inapplicable condition (11.4%). Results were similar when they were included, but the effects were generally weaker.

Procedure

The study was administered on the computer. Participants signed the consent form and were seated individually in front of computers, and were told that the study examined how people go about processing information about others. After participants learned about the target group, they performed the prediction task, and answered questionnaire items. Finally, participants filled out demographics, and were debriefed and dismissed.

Results

Analytic Approach

The design of the study imposed a limitation to statistical analysis. Knowledge Applicable and Inapplicable conditions were paired by the given knowledge, and Knowledge Inapplicable and Uninformative conditions were paired by prediction situations. Thus, Knowledge Applicable and Uninformative conditions were different on both of the two aspects of manipulation, and it was not possible to run statistical tests to compare these two conditions directly. Therefore, comparisons were made in pairs: between Knowledge Applicable and Inapplicable conditions (effects of *Knowledge Applicability*) and between Knowledge Inapplicable and Uninformative conditions (effects of Knowledge Informativeness). After the two pairs of conditions were compared on Perceived Knowledge, Perceived Difficulty, and Future Outlook (the main dependent measure of interest), mediation analysis was run using Knowledge Applicable and Inapplicable conditions, to test for the causal links from Knowledge Applicability to Future Outlook through Perceived Difficulty. Statistical analyses were run using PASW Statistics 18, Release Version 18.0.0 (SPSS, Inc., 2009, Chicago, IL, www.spss.com).

Did Knowledge Manipulation Affect Participants' Perceptions of How Well They Know the Targets?

Effect of Knowledge Applicability.

Table 2 shows the means of questionnaire measures in the three conditions. First, I tested the effect of Condition on how well participants felt they knew the target group (Perceived Knowledge). A comparison between Knowledge Applicable and Inapplicable conditions indicated that participants in the Knowledge Applicable condition felt they knew about the targets more than participants in the Knowledge Inapplicable condition did, $t(54) = 2.52$, p $= .02$, d $= .67$.

Effect of Knowledge Informativeness.

Participants in the Knowledge Uninformative

Table 2. Means (and standard deviations) of questionnaire measures

	Conditions		
	Knowledge Applicable	Knowledge Inapplicable	Knowledge Uninformative
Perceived Knowledge	4.72 (1.10)	3.89 (1.38)	2.82 (1.59)
Perceived Difficulty	2.64 (.83)	3.73 (.81)	3.26 (1.01)
Future Outlook	4.07 (1.26)	3.72 (.82)	4.77 (.75)

condition felt they knew about the targets to the least degree, less than those in the Knowledge Inapplicable condition did, $t(56) = 2.71$, p = .01, d = .72. Both of these results were as expected, and consistent with the explanation that perceived knowledge about targets depends both on actual substantive knowledge about them and on whether the knowledge is useful in making predictions about them in the given contexts.

Did Knowledge Manipulation Affect the Subjective Experience of Imagination?

Effect of Knowledge Applicability.

Next, Perceived Difficulty of the prediction task was compared between conditions to examine whether having knowledge was conducive to easier prediction. For Perceived Difficulty, comparisons showed that, first, participants in the Knowledge Applicable condition experienced significantly less difficulty than those in the Knowledge Inapplicable condition did, $t(54) = 4.93$, $p < .01$, $d = 1.32$. This was consistent with the prediction that participants in the Knowledge Applicable condition would perform the prediction task more easily owing to the knowledge being helpful in imagination.

Effect of Knowledge Informativeness.

Second, participants in the Knowledge Inapplicable condition felt slightly more difficulty than those in the Knowledge Uninformative condition did, $t(56) = 1.90$, $p = .06$, $d = .50$: This difference, although

marginally significant, points to the possibility that participants in the Knowledge Uninformative condition, with no knowledge about the targets to help them, resorted to some knowledge they already had that is not about the targets.

Did Knowledge Manipulation Affect Outlook of Future Interaction?

Effect of Knowledge Applicability.

The critical test of this study was to see whether availability of group knowledge that is helpful in prediction influenced outlook of future interaction with members of the target group. Participants in the Knowledge Applicable condition had more positive Future Outlook than those in the Knowledge Inapplicable condition did, but this difference was not quite strong enough to be statistically significant, $t(48.70) = 1.24$, $p = .22$, $d = .33$ (a t-test without assumption of equal variance was run, because a Levene's test indicated that variances of Future Outlook in the two conditions were significantly different, $p = .03$).

Effect of Knowledge Informativeness.

As for the comparison between Knowledge Inapplicable and Uninformative conditions, participants in the Knowledge Uninformative condition had more positive Future Outlook: The score was significantly higher than that in the Knowledge Inapplicable condition , $t(56) = 5.08$, $p = .01$, $d = 1.33$, and was actually even higher than that

in the Knowledge Applicable condition. Again, this difference (along with the effect found for Perceived Difficulty) is consistent with the interpretation that participants in the Knowledge Uninformative condition may have used person schema about others, which helped them make the predictions with more ease and thus form more positive expectations about the targets.

Did Perceived Difficulty Mediate the Effect of Knowledge Applicability on Future Outlook?

The reasoning behind the prediction that participants in the Knowledge Inapplicable condition would have a more negative outlook of future intergroup interaction than participants in the Knowledge Applicable condition would, was that they would experience more difficulty during prediction task. Considering that Perceived Difficulty was higher in the Inapplicable condition (indicating the Knowledge Applicability-to-Perceived Difficulty path), as well as that it correlated with Future Outlook, $r = -.25$, $p < .05$ (indicating the Perceived Difficulty-to-Future Outlook path), it is conceivable that Perceived Difficulty mediated the effect of Knowledge Applicability on Future Outlook.

At first glance, it does not seem sensible to consider mediation because the difference in Future Outlook between Knowledge Applicable and Inapplicable conditions was not significant. But (as discussed in Footnote 1) it was possible that participants' outlook of future interactions with the targets was affected by the valence of their impression of the target group in these two conditions. That is, while care was taken to make the group seem as neutral as possible, the overall impression of a group of people who are both perfectionistic and thrifty may have been more negative than positive. For example, one participant

described the targets as: "They are a bunch of perfectionists who place all their trust in their own abilities. They are also very stingy with their money never using it to enjoy themselves." If the general impression of the targets was indeed negative, participants who felt more strongly that they knew about the targets may have had more negative impression of the group, and therefore more negative future outlook as well.

Support of this possibility of knowledge-impression relationship was found in the patterns of correlations between Perceived Knowledge and the three subconstructs of Future Outlook in each condition (Table 3). In the Knowledge Applicable and Inapplicable conditions (where the targets were described as perfectionistic and thrifty), as Perceived Knowledge score increased, Expected Quality decreased, and Anticipated Anxiety (only in Knowledge Applicable condition) and Intention to Avoid increased. This implies that overall impression of the targets in these two conditions was negative, and that the more one thought s/he knew the targets, the more negative his/her future outlook was, presumably because the impression of the targets was more negative. Meanwhile, the pattern was opposite in the Knowledge Uninformative condition: As Perceived Knowledge increased, Expected Uncertainty decreased, Expected Quality increased, and Anticipated Anxiety and Intention to Avoid decreased). Unlike in the other two conditions, it seems, overall impression of the targets in the Knowledge Uninformative condition was positive. These differential patterns in correlations were supported by comparing the coefficients across conditions using Fisher's Z transformation: None of three subconstructs significantly differed in their correlation coefficients between Knowledge Applicable and Inapplicable conditions, while all three coefficients were different between Knowledge

Table 3. Correlations of Perceived Knowledge with outlook of future interaction measures in three conditions

	Condition		
	Knowledge Applicable	Knowledge Inapplicable	Knowledge Uninformative
Expected Quality	.30	.63*	.41*
Anticipated Anxiety	.34†	.00	.18
Intention to Avoid	.30	.45*	.25

† $p < .10$. *$p < .05$. **$p < .01$.

Applicable and Knowledge Uninformative conditions, and two out of three (Expected Quality and Intention to Avoid) differed between Knowledge Inapplicable and Knowledge Uninformative conditions.

It was reasonable to suspect that Perceived Knowledge—which was now assumed to subsume the measure of overall impression of the targets in Knowledge Applicable and Inapplicable conditions—acted as a suppressor variable of the relationship between Knowledge Applicability and outlook of future interaction. That is, it was possible that the effect of Knowledge Applicability through Perceived Difficulty on Future Outlook was positive and significant, but that it was partly offset by the indirect *negative* effect through Perceived Knowledge (i.e., the product of positive effect of Knowledge Applicability on Perceived Knowledge, and the negative effect of Perceived Knowledge on Future Outlook).

To test whether a suppressor effect of Perceived Knowledge concealed a significant effect of Knowledge Applicability on Future Outlook through Perceived Difficulty, a mediation model was tested with Perceived Knowledge as a suppressor and Knowledge Applicability as a mediator, using the data from Knowledge Applicable and Inapplicable conditions only. According to MacKinnon, Krull, and Lockwood (2000), a suppressor can be treated statistically in the same way as a mediator, except for that it acts to cancel out the direct effect of the

independent variable on the dependent variable, rather than to explain it. If Perceived Difficulty indeed acted as a mediator, the two indirect effects (one through Perceived Knowledge and the other through Perceived Difficulty) would be in opposite directions, so that they would cancel out each other. Bias corrected bootstrapping method was used with Preacher and Hayes's (2008) SPSS macro. Knowledge Applicability was entered as the predictor, Future Outlook as the criterion, and Perceived Difficulty and Perceived Knowledge as the mediators, with 2,000 resamplings.

The result was as expected (Figure 1): The estimate of the indirect effect of Knowledge Applicability on Future Outlook through Perceived Difficulty (i.e., the product of the effect of Knowledge Applicability on Perceived Difficulty and the effect of Perceived Difficulty on Future Outlook) was .21, and the 95% confidence interval was from .04 to .48, meaning the effect was significant at $p < .05$. As for the indirect (suppressor) effect through Perceived Knowledge, the estimate was −.15, and the 95% confidence interval was from −.32 to −.04; in other words, the suppressor effect was significant at $p < .05$ as well. Together, the total indirect effect through the two mediators was estimated at .06, with 95% confidence interval from −.17 to .31 – as expected, effects through the two mediators cancelled each other out. Thus, the data indicates that both the mediator effect of Perceived Difficulty and the suppressor effect of Perceived Knowledge

were significant, and together they fully explained the effect of Knowledge Applicability on Future Outlook.

Discussion

This study aimed to answer two questions, one involving the availability of informative knowledge about others, and the other involving the applicability of knowledge. Regarding the latter, it was predicted that even when one has knowledge about the targets, it would not help in having positive outlook about future interaction with them unless the knowledge is something that can be used in anticipating their possible thoughts and behaviors. Further, it was predicted that this was because one would feel more difficulty in imagination, compared to when one has useful knowledge. Comparisons between Knowledge Applicable and Inapplicable conditions showed support of these predictions. After the suppressor effect of Knowledge Applicability on Future Outlook through Perceived Knowledge were controlled for, it was revealed that participants in the Inapplicable condition had more negative expectations about future interaction with the targets than participants in the Applicable condition did. Moreover, this was explained by the fact that they faced more difficulty imagining their possible reactions, after the suppressor effect of perceived knowledge about the targets was controlled for. This mediation model is in line with findings of the fluency literature (e.g., Topolinski & Strack, 2009; Lee & Labroo, 2004), which showed that manipulation of processing fluency influences subjective feelings, which in turn affects subsequent judgments (e.g., attitude, truthfulness) about the target. The fact that the positive effect of imagination difficulty on outlook of future interaction was observed even though the target knowledge itself was not exactly positive attests the independence of this effect from that of knowledge valence.
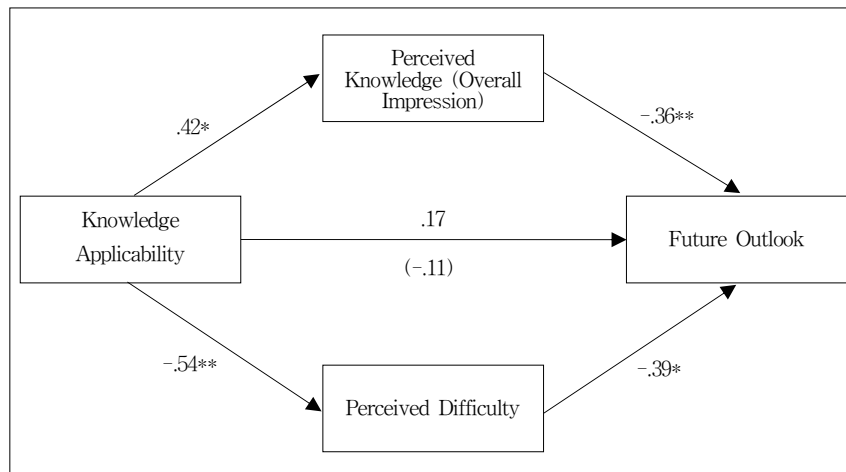

Figure 1. Effect of Knowledge Applicability on Future Outlook, mediated by Perceived Difficulty and Perceived Knowledge. Note. The numbers are unstandardized regression coefficients. The number in the parentheses is the direct effect after controlling for the effect of mediators. Knowledge Applicability was coded as 1 = Knowledge Applicable and −1 = Knowledge Inapplicable.
✝ $p < .10.$ *$p < .05.$ **$p < .01.$

In regards to what would happen when no informative knowledge about targets is available, two alternative hypotheses were posed and tested. The data seem to be more supportive of the possibility that, without any knowledge about the group, participants assumed that the targets were average individuals and used schema about average people (Karniol, 2003), and that this helped them feel more positive about future interaction with the target group members. It is reasonable to surmise that, other things equal, not having any knowledge about potential interaction partners at all is, paradoxically, not necessarily bad for interaction – as long as they are not explicitly depicted as unfamiliar and novel. It seems that descriptions of the targets involved in everyday events in the Knowledge Uninformative condition helped them be perceived as prototypical (and possibly as moderately positive in valence); if they were described in a way that does not permit application of prototype schema, participants in that condition may have experienced much more difficulty in imagination. Although exactly what person schema was used in the Knowledge Uninformative condition is inconclusive for now, further examination with manipulation of typicality will be able to elucidate this issue.

The findings in this study have immediate implications in intergroup and interpersonal interaction. It seems that merely having knowledge about an outgroup is not enough: In order to form a more positive expectations about intergroup interaction, it is important to have knowledge that is helpful in imagining outgroup members' possible reactions in socially relevant situations. For example, when fostering intergroup interaction, it may be more effective to provide information about the outgroup that is applicable to the specific interaction context, rather than some historical or cultural backgrounds that are not immediately relevant to the situation. The study findings also point to the fact that while positive attitude toward an outgroup is typically thought to lead to more intergroup contact, a more fine-grained examination of factors of intention to interact is needed. In other words, although thinking positively about an outgroup and its members would be a necessary condition of voluntary intergroup interaction, imagination difficulty can diminish or even cancel out such an effect of positive attitude. It is important to foster positive intergroup attitude at an abstract level, but an effective intervention strategy should also include ways to make it easier to think of outgroup members' thoughts and behaviors to encourage actual intergroup contact. In addition, the data suggest that when one has no applicable knowledge about the outgroup, an intervention strategy that induces usage of more available information about other people may be effective. For example, a strategy can make similarities between the self and an outgroup member through perspective-taking (Galinsky & Moskowitz, 2000), so that one will project his/her own personality attributes to the outgroup member, and imagine the person's thoughts and behaviors more easily. Likewise, in interactions at a more interpersonal level, this study suggests that strategies addressing social anxiety (Schlenker & Leary, 1982) that deals with metacognitive experience of imagery (e.g., gathering information about interaction partner that is relevant to the immediate interaction situation, or changing conceptions about imagination difficulty) may be effective in alleviating the uncertainties and negative expectations involving social interactions of social phobics.

Would culture interact with the effect of imagination difficulty observed in this study? If it does, how? Even though cross-cultural comparison is required to test for any cultural influence on the

effect of imagination difficulty on outlook of future interaction, some (conflicting) hypotheses about the relative impact of imagination difficulty on outlook of future interaction can be made based on previous research. First, East Asians may feel less difficulty than people of Western cultures when imagining others' possible responses because they are better perspective-takers. Wu and Keysar (2007) reported that Chinese participants engaged in more perspective-taking compared to their American counterparts in a paired communication game, presumably because the interdependent nature of their culture (Markus & Kitayama, 1991) requires them to be more attuned to others' thoughts and intentions. Applying this finding to the context of imagining others' possible responses, Chinese people (and other East Asians by extension) may do more perspective-taking and project their own intended reactions to others, thereby doing the task with more ease whether one has had previous exposure to the outgroup or not. This may mean that imagination difficulty plays a lesser role in a collectivistic culture such as Korea simply because imagination would be less difficult. Second, an opposite prediction can be made based on findings that East Asians use more stereotypes. Spencer-Rodgers, Williams, Hamilton, Peng, & Wang (2007) showed that Chinese more readily use stereotypes than Americans do when perceiving and making inferences about outgroup members, because groups play more central and important roles in the psychological lives of people in collectivistic cultures. Therefore, East Asians may be more likely to have elaborate stereotype knowledge about social groups, and also be less reluctant to apply them when imagining individual group members' thoughts and behaviors. This could mean that outgroup knowledge has a larger impact on outlook of future interaction for East Asians. This is an interesting topic that

merits future inquiry.

There are limitations to this study. First, there is ambiguity in the meaning of Perceived Knowledge measure: Its pattern of correlations with other measures implies that it reflected not only how much participants felt they knew the targets, but also the valence of their impression. A purer measure of perceived knowledge without any element of impression (and vice versa) may have unambiguously teased apart the contributions of the two variables, and enabled a clearer interpretation of results. On a related note, if more neutral traits were used in descriptions of the targets, participants across conditions may have formed impressions that were comparable in terms of valence. Second, the study may have benefited from a more complete and symmetrical design. Only three conditions representing three possible ways that knowledge and prediction situations can be related were used for the sake of economy in study design. But as a result, it was impossible to completely control the effect of group impressions (due to the valence of traits used). Also as a result of having only three conditions, statistical tests of differences between Knowledge Applicable and Uninformative conditions were precluded. A more thorough test of the hypothesis may have involved a study with 6 conditions, defined by three sets of group descriptions (one about trait set A, one about trait set B, and one with filler description), crossed with two sets of prediction situations (one pertaining to trait set A, and the other with trait set B).

In conclusion, this study showed how knowledge about potential interaction partners can affect one's expectations about interacting with them before an interaction is initiated. Knowledge about others influenced metacognitive feelings of difficulty imagining their thoughts and behaviors, and participants used such experience as information to

guess what can be expected in possible interactions. Rather than the amount of knowledge per se, whether the knowledge is useful in the task of imagination was pivotal in the outlook of future interaction. These findings complement the research on the positive effect of contact on attitude change (Hubbert et al., 1999; Hammer et al., 1998; Stephan & Stephan, 1992; Islam & Hewstone, 1993), by clarifying the role of knowledge in alleviating apprehensions and promoting further interactions with others. At the same time, this study contributes to the metacognition literature by applying the concept of processing fluency to the domain of social interaction, and adding to a more complete picture of thought and decision processes involving interactions at both interpersonal and intergroup levels.

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다른 사람에 대한 지식이 미래 상호작용 전망에 미치는 효과

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본 연구에서는 다른 사람에 대한 지식이 미래 상호작용을 예측할 때 상대방의 가능한 생각과 행동 상상의 난이에 영향을 줌으로써 미치는 역할을 조사하였다. 실험참가자들은 대상들에 대한 정보를 제공받았다. 이때 실험은 대상에 대한 정보 유무와 정보의 적용 가능성의 두 차원으로 조작되었다. 대상의 반응을 상상할 때 유용한 지식을 갖고 있는 것은 미래 상호작용 전망에 긍정적인 효과를 보였다. 경험된 난이도는 반응을 상상하는 동안 이 효과를 부분적으로 매개하였다. 또한 실험참가자들은 대상에 대한 정보적 지식이 없는 경우 다른 유효한 지식을 적용하는 것처럼 보였다.

주요어: 추측, 예상, 상호작용, 어려움*(difficulty)*, 메타인지, 매끄러움*(fluency)*