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RESEARCH ARTICLE

The Effects of Social Comparison and Objective Feedback on Work Performance Across Different Performance Levels

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ABSTRACT

This study investigated the interaction effects of feedback content type (social comparison feedback vs. objective feedback) and two different performance levels (high vs. low) on work performance. One hundred fifty participants were recruited and asked to perform a simulated work task in a preliminary session. Based on their performance, the upper 40% (high performance) and lower 40% (low performance) groups were selected for the main experiment. Participants in each group were randomly assigned to the two different experimental conditions: objective feedback and social comparison feedback. For the participants in the objective feedback condition, information on the number of correctly completed work tasks was provided. For the participants in the social comparison feedback condition, rank information on their performance was provided. The results indicated that social comparison feedback was more effective than objective feedback for the high performers, but was less effective for the low performers.

KEYWORDS

Social comparison; objective feedback; performance level; feedback content

Feedback has been the most frequently used intervention in the field of Organizational Behavior Management (OBM). The effectiveness of feedback has been demonstrated in numerous studies conducted in both field and laboratory settings. Despite the prevalence of feedback interventions, some issues remain to be solved to further increase their effectiveness. As identified in two comprehensive reviews by Balcazar, Hopkins, and Suarez (1985) and Alvero, Bucklin, and Austin (2001), feedback may be categorized based on different characteristics (i.e., feedback source, privacy, participants, content, mechanism, and frequency) and its effectiveness may vary depending on the variations of each characteristic.

Of those characteristics, the present study focused on feedback content, which is defined as the type of information provided to feedback recipients. For example, this information may include an individual's performance data compared with the individual's previous performance. Alternatively, it may

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include the individual's performance data compared with group performance. In their reviews, Balcazar et al. (1985) and Alvero et al. (2001) identified eight and 12 different types of feedback content, respectively. However, regardless of the number of content types identified, feedback can be grouped into two broad categories. One feedback category, objective feedback, includes objective information on the performance of an individual or a group in comparison to the individual or group's own previous performance. The other feedback category, social comparison feedback, includes information on the performance of an individual or group in comparison to that of other individual(s) or group(s). Both reviews indicated that significantly fewer studies used social comparison feedback. In fact, only 17 out of 114 studies reviewed in Balcazar et al. and 13 out of 64 studies reviewed in Alvero et al. used social comparison feedback. However, the effects of social comparison feedback were comparable to or even better than those of objective feedback. In Balcazar et al., the percentages of studies utilizing social and objective feedback that produced consistent effects were 59 (7 out of 13) and 53 (30 out of 51), respectively. In Alvero et al., the percentages were 53 (9 out of 17) and 39 (38 out of 97), respectively.

The effectiveness of social comparison feedback may be due to its inherent evaluative characteristic. Festinger (1954) postulated in the social comparison theory that people have a desire to evaluate their abilities and, as a way to fulfill this desire, attempt to compare themselves with other people. If this is the case, most people probably have a history of evaluating themselves when social comparison information is available. For example, after exposure to the information indicating a person's performance is below/above average, a worker is likely to self-evaluate the performance by saying (overtly or covertly) that person did a poor or good job.

Although feedback incorporates several components that may contribute to the production of differential effects (Johnson, Rocheleau, & Tilka, 2015), the importance of the evaluative component of feedback has been recognized by several researchers (e.g., Johnson, 2013; Johnson, Dickinson, & Huitema, 2008). Feedback basically includes objective information about past performance, but it is rarely delivered without some form of evaluation such as praise or criticism. Several researchers have suggested that evaluation may be a more important component than objective information in improving performance. Brown, Willis, and Reid (1981) compared the effectiveness of objective feedback with and without praise in increasing on-task behaviors and decreasing off-task behaviors of staff at a residential facility. The results indicated that objective feedback without praise had little or no effect on increasing on-task behaviors, although it decreased off-task behaviors. Crowell, Anderson, Abel, and Sergio (1988) also compared the effects of objective feedback with and without praise on bank tellers' service behaviors to customers. Objective feedback was effective in increasing the quality of the tellers' interactions with clients, but adding

praise to objective feedback further increased the quality of the interactions. Laboratory studies have also shown similar results. Chapanis (1964) demonstrated that participants who received only objective feedback (i.e., without any positive or negative responses from researchers) on their performance did not perform significantly better than those who did not receive feedback. More recently, Johnson et al. have also shown that objective feedback alone did not increase performance, although this result conflicts with that of a later study conducted by Johnson (2013).

Given that the evaluative component of feedback is important and social comparison feedback inherently includes this property, it would seem to be advantageous to utilize social comparison feedback or add it to objective feedback. However, one issue that should be considered when utilizing social comparison feedback is that it might strengthen performance for high-performing workers, but weaken performance for low-performing workers. In contrast, objective feedback may function as a punisher (e.g., when it indicates that performance is deteriorating or not improving), regardless of workers' performance level.

Given that social comparison feedback may serve different behavioral functions depending on performance level, it is possible that social comparison feedback is more effective than objective feedback for high performers. For low performers, on the other hand, objective feedback may be more effective than social comparison feedback because objective feedback may function as a reinforcer when it shows performance is improving. Social comparison feedback, on the other hand, may function as a punisher even when performance is improving. Thus, the purpose of the current study was to examine the interaction effects between feedback content type (social comparison vs. objective feedback) and performance level (high vs. low) on work performance.

Method

Participants and setting

One hundred fifty undergraduate students from a large university were recruited via advertisements on a bulletin board at the school website. Their mean age was 22.66 years ($SD = 2.20$). The experiment was conducted in three computer laboratories, each of which contained between 70 and 80 personal computers. All the computers used Microsoft Windows 7TM as an operating system. A computerized simulated work task was used for the current study, which is described below.

Work task and dependent variable

The work task used for the current study simulated an online bank money transfer. When the experimenter launched the work task software, participants

encountered the computer screen displayed in [Figure 1](#). At the upper portion of the screen, the name of the company and the amount of money participants had to transfer appeared (e.g., Hyundai Mobis / \$854607). To transfer the money, participants had to use the information provided in the handout they received at the beginning of the experiment. The handout consisted of four tables (see [Figure 2](#)). The table on the top included a list of company names to each of which a specific number was assigned. For example, the number “12” was assigned to “Hyundai Mobis.” The second table from the top included a list of numbers to each of which a specific bank name was assigned. For example, “KooKmin” was assigned to the number “12.” The third table from the top included a list of numbers, to each of which a specific account number was assigned. For example, account number, “6112–325-665478” was assigned to the number “12.” Using the information provided in these three tables, participants had to type in an appropriate bank name, an account number, and the money amount in the blank boxes provided on the screen (see [Figure 1](#)). On the bottom portion of the screen, two security codes that were partially completed were provided and participants had to complete the security codes by typing in the missing letter(s) or number(s) using the information provided in the table on the bottom of the handout. Utilizing the already given letter(s) or number(s) in the partially completed security codes, participants had to find a complete security code in the table and type in the missing letter(s) or numbers(s). For example, “H,” “9,” “E,” and “8” were given on the screen as shown in [Figure 1](#). Therefore, participants had to type in “5,” “G,” and “8” using the table. After this, participants had to click the “Transfer” button. When this was completed, the computer recorded it as one completed work task and restarted a new money transfer task. The dependent variable was the number of correctly completed work tasks.

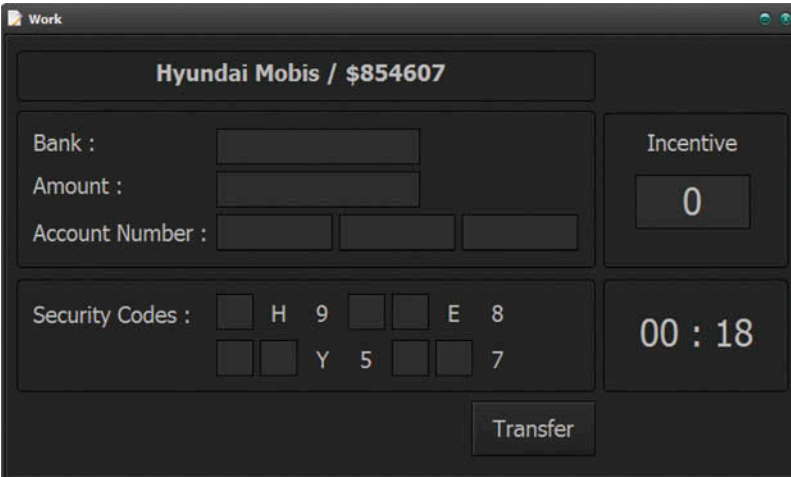


Figure 1. The simulated online bank money transfer task used in the study.

The List of Company Names				
Lotteshopping: 18	Kolon: 28	Bytheway: 19	Hyundai Oilbank: 22	
Kumho Tire: 23	Byucksan: 17	Google Korea: 02	Doosan Infracore: 04	
Pulmuone: 15	Eland Retail: 08	S-oil: 10	Doosan Motors: 13	
Chevrolet: 26	LG Fashion: 24	Hyundai Mobis: 12	GS Homeshopping: 11	
Ildong: 13	Hyundai Motors: 14	Livart: 30	Cheil Worldwide: 16	
Sampyo: 21	Hyundai Card: 06	SSangyoung: 07	Sony Korea: 20	
Crown: 01	Cocacola: 25	GS Retail: 05	Hanwha Construct: 03	
BR Korea: 27	Hyosung: 32	BC Card: 29	Asiana Airlines: 09	
The List of Bank Names				
02: Nongmin	04: Kookmin	14: WooRi	23: KookMin	
16: Shinan	26: HaNa	08: JoChuk	06: Woori	
28: CiTi	10: WooRi	22: NongMin	25: kookmin	
15: Shinhan	18: Woori	12: KooKmin	01: Geumgo	
30: Nonghup	11: Citi	05: Nonghop	29: KookMin	
17: Hana	31: City	20: ShinHan	21: Halla	
07: Halla	13: Kookmin	09: GeumGo	32: WooRi	
24: Nongrim	03: Woorim	27: Jochuk	19: JeoChuk	
The List of Account Numbers				
02: 1003-765-632201	09: 7698-8165-56741	11: 830-001654-2107	21: 32210-587-49621	
16: 817-757632-1027	25: 913-5522-563127	30: 5115-5621-30147	07: 865-882210-5456	
10: 911-2256-229854	19: 114-5446-201366	20: 7395-4512-45127	18: 968-2258-446821	
28: 822-884412-3012	03: 1008-135-486523	23: 962-5489-556629	04: 32256-689-10254	
13: 32456-699-10454	24: 921-1003-522265	29: 1005-956-854521	17: 39868-665-44112	
31: 6952-256-214552	14: 1002-733-521458	05: 110-0053-008966	32: 5101-1410-14206	
08: 6015-545-784233	01: 115-5568-650012	26: 30014-998-97854	12: 6112-325-665478	
15: 7111-2013-15623	06: 4002-733-721458	22: 1005-774-816595	27: 111-3321-335874	
The List of Security Codes				
AT2Q5YW	D4GP7EW	ZC48JEY	2H3B6NM	9HXYWA5
74BG5EW	DB9KN54	KT9W6QE	SD3C8BN	6LS4WDE
HMV7AE5	A784KAC	2HM2QWV	1RDH8S5	G9MKGEE
W34QASS	5H9G8E8	HG7P6ZE	MJ4M62N	4SFCXS4
5MOON12	3CH2IO7	C5H8O4A	18OAH4G	1HY5UN7
46LHSWV	MMKOT42	7X4CD74	N6H3PES	XE6SD5A
PMV9DE7	H294KUC	6HD2XWS	HRD98SE	39MKLEE
3KPC6CJ	4GF3E2B	APHN65E	4P9LTRW	WZB45NN

Figure 2. The information provided in the handout for performing the work task.

Independent variables and experimental design

The independent variables were feedback content type and performance level. We originally recruited 150 participants and asked them to perform the work task in a 20 min pre-session. Based on the performance scores obtained in this session, only participants whose scores were in the upper 40% (high performance group: 60 participants) and lower 40% (low performance group: 60 participants) were selected for the experimental sessions. The criteria for the selection (i.e., upper and lower 40%) were arbitrary. We attempted to make the two groups as different as possible in terms of performance by eliminating the middle 20% rather than simply dividing

the 150 participants into two 75 member groups. At the same time, we had to include enough participants in each group to guarantee statistical power. There were two types of feedback content: objective feedback and social comparison feedback. Participants in both the high and low performance groups were randomly assigned to one of the two feedback conditions. Thus, a 2 x 2 factorial design was used: high performance/objective feedback, high performance/social comparison feedback, low performance/objective feedback, and low performance/social comparison feedback. Participants in the objective feedback condition received written feedback on the number of correctly completed work tasks as follows: “The total number of work tasks you completed was _____. Of these, the number of correctly completed work tasks was _____.” Participants in the social comparison feedback condition received written feedback on their ranks in their groups as follows: “Your performance was _____ place out of 60 people.”

Procedure

Before the experiment, the 150 participants attended an introductory session. In this session, the experimenter demonstrated individually to each participant how to perform the work task. Then, participants had an opportunity to practice performing the task until they could correctly complete five work tasks in a row. Immediately after the introductory session, participants attended a 20 min pre-session. As described in the previous section, only 120 participants were selected based on their performance in this session. The remaining 30 participants who were not selected for the experimental sessions were paid 6,000 won (1 U.S. dollar was equivalent to approximately 1,115 won at the time of the experiment) and received a 2,500 won coffee voucher.

Three days after this pre-session, the 120 participants simultaneously attended three 20 min experimental sessions in a single day. We instructed participants to complete as many work tasks as possible. Participants were told they would be paid 20,000 won and receive a 2,500 won coffee voucher at the end of the experiment. Participants took a 10 min break after each experimental session. During the breaks, the experimenters retrieved the data saved in the computer and obtained the number of correctly completed work tasks for all participants. This information was provided in written form as objective feedback for participants in the objective feedback groups immediately before the next session started. Based on the information on the number of correctly completed work tasks, the rank scores for participants in the two social comparison feedback groups were calculated. This rank information was provided in written form for participants in the social comparison feedback groups immediately before the next session started. For the first experimental sessions, on the other hand, the performance

data during the pre-session were utilized. All participants were paid 20,000 won and received a 2,500 won coffee voucher after the completion of all three experimental sessions.

Results

The mean number of correctly completed work tasks for participants in the high performance/objective feedback, high performance/social comparison feedback, low performance/objective feedback, and low performance/social comparison feedback group was 19.82 ($SD = 2.68$), 22.06 ($SD = 3.53$), 16.20 ($SD = 3.34$), and 13.38 ($SD = 2.61$), respectively (see Figure 3).

To determine whether performance differed across the different experimental conditions, a two-way analysis of variance (ANOVA) was conducted. The main effect of feedback type was not statistically significant at the .05 level ($F = .28, p = .60$). However, the interaction effect between feedback type and performance level was statistically significant at the .05 level ($F = 20.39, p = .00$). Figure 3 displays the pattern of the interaction effect between feedback type and performance level. For the high performance group, the mean number of correctly completed work tasks for the participants who received social comparison feedback was significantly higher ($F = 7.96, p = .01$) than the mean for those who received objective feedback. For the low performance group, however, the mean number of correctly completed work tasks for the participants who received objective feedback was significantly higher ($F = 12.71, p = .00$) than the mean for those who received social comparison feedback.

Figure 4 displays the mean number of correctly completed work tasks over time. Participants in all four conditions showed increases in performance across the pre-session, and the first, second, and third

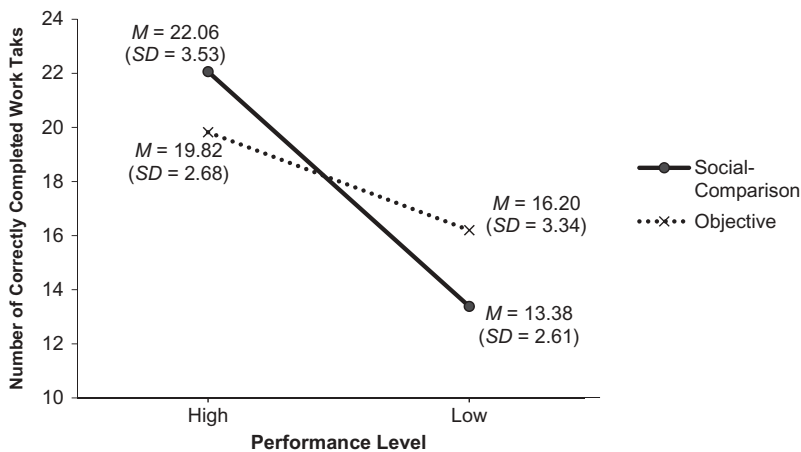


Figure 3. Means and standard deviations for the four experimental conditions.

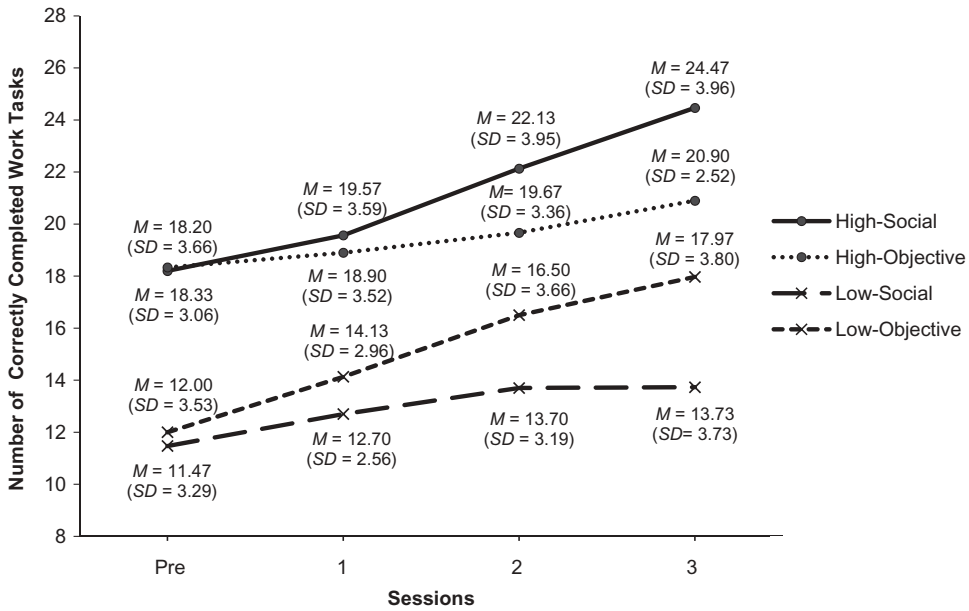


Figure 4. Means and standard deviations of correctly completed work tasks across experimental conditions over time.

experimental sessions. We conducted one-way ANOVAs to determine whether the means for the pre-session and the average performance during the three experimental sessions differed for the four experimental conditions. The average performance during the three experimental sessions was significantly higher than the means for the pre-session for all experimental conditions; high/objective ($F = 7.71, p = .01$), high/social ($F = 52.08, p = .00$), low/objective ($F = 61.80, p = .00$), and low/social ($F = 12.80, p = .00$).

Table 1 shows the results of one-way ANOVAs conducted to determine if the performance differences between the two different feedback conditions for both groups in each session were significantly different. For both groups, the performance differences between the two feedback conditions were not significantly different in the pre-session and first session, but were significantly different in the second and third sessions.

Table 1. The Results of One-Way Analysis of Variance Conducted for the Performance Differences Between the Two Different Feedback Conditions in Each Session.

Performance level	Session											
	Pre			First			Second			Third		
	<i>F</i>	<i>p</i>	η^2	<i>F</i>	<i>p</i>	η^2	<i>F</i>	<i>p</i>	η^2	<i>F</i>	<i>p</i>	η^2
High	.02	.88	.00	.66	.42	.01	7.24	.01	.06	15.13	.00	.12
Low	.37	.54	.00	3.04	.08	.03	9.33	.00	.07	21.31	.00	.16

Discussion

The main purpose of the current study was to examine possible interaction effects between feedback content type (social comparison vs. objective feedback) and performance level (high vs. low) on work performance. As anticipated, social comparison feedback was more effective than objective feedback for the high performers, but objective feedback was more effective than social comparison feedback for the low performers. This pattern of performance became clearer over time. As indicated in [Table 1](#), during the pre and first experimental sessions, social comparison feedback and objective feedback did not produce differences in performance for either high or low performers. During the second and third sessions, however, they produced significant differences in performance for both groups. In addition, the effect sizes increased over time for both groups. As we proposed, these results indicate that social comparison feedback might have served different behavioral functions for participants with different performance levels. Careful scrutiny of the data indicated that seven of 30 participants in the low performance/social comparison feedback group showed a performance decrease from the pre-session to the experimental sessions. In contrast, all participants in the high performance/social comparison feedback group improved their performance. Therefore, for those who showed a performance decrease, social comparison feedback might have functioned as a punisher. On the other hand, for the majority of participants including those in the low performance group, it might have functioned as a reinforcer in that their performance increased over time. Taken together, the results suggest that social comparison feedback can be a powerful behavioral intervention, especially for high performers. However, caution should be exercised when implementing it with low performers.

Given that several previous studies (e.g., Crowell et al., 1988; Brown et al., 1981; Chapanis, 1964; Johnson et al., 2008) found that objective feedback had no or only a limited effect in increasing performance, it is worth noting that the objective feedback implemented in the current study improved performance. Although feedback is rarely delivered without some form of evaluation and the evaluative component may be crucial for improving performance, the results suggest that the objective component is also important. These results are also consistent with Johnson (2013), who demonstrated that having both objective and evaluative feedback is beneficial. It has long been emphasized in the OBM field that for feedback to be effective, it should contain specific information on performance. Providing evaluative feedback without objective information on performance may not maximize performance because specificity is lacking when only evaluative feedback is delivered. As found in the current study, this might be especially true for low performing or novice workers. Several researchers have suggested that performance level or work experience may be an important variable to consider

when introducing behavioral interventions. Daniels and Bailey (2014) have noted that for workers with extensive work experience, pinpointing specific behaviors is not required because they already know what is required to produce desirable results. Similarly, Huber (1985/1986) stated that assigned goal setting rather than participative goal setting is more likely to be effective when workers lack experience. Also, a laboratory study conducted by Jung, Lee, and Oah (2012) demonstrated that specific feedback was more effective than global feedback for unskilled workers, but the two different types of feedback had comparable effects for skilled workers. Future studies should examine the possible interaction effects between variables involved in behavioral interventions.

A unique feature of the current study is that individual rank information, which has not previously been used as feedback in the OBM field, was used as social comparison feedback. In previous feedback studies, individual performance was compared with an average or standard of group performance as social comparison feedback. Compared to these types of social comparisons, individual rank information is much more specific and, therefore, could be more effective. Future studies should examine the possible superior effects of rank information to group average or standard information. In addition, the combined effects of both rank and objective information should be examined. Although individual rank contains more specific information than group average or standard, it still lacks objective information on performance itself. Therefore, it would be interesting to examine whether providing both rank and objective information, compared to providing rank information only or objective information only, produces an additional impact on performance. Related to this issue, a limitation of the current study is that social comparison feedback contained only one dimension of information (i.e., rank information) and objective feedback contained two dimensions of information (i.e., quantity and quality of performance). That is, social comparison feedback contained less specific information on performance than objective feedback. Thus, it is plausible that the difference in the specificity of information might have influenced the current results.

Another issue that should be considered when using social comparison feedback is possible emotional responses of workers. It is presently unknown whether worker preference and/or possible emotional responses associated with receiving social comparison feedback might be negative. Some workers may have a history of negative emotional responses after receiving feedback that their performance is substandard. If this is the case, workers may react negatively to receiving social comparison feedback and may not prefer it. Worker preference and emotional responses are no doubt important variables to consider when implementing behavioral techniques. Therefore, it would be important to examine these topics in future studies.

Another issue for future research is the effect of verbal statements regarding performance on work performance. For example, future research should evaluate the effects of telling participants they were included in a high performance or low performance group regardless of their actual performance. Future research should also evaluate the effects of providing participants with false rank information while providing accurate objective information on their performance. Further, it is possible that this type of verbal statement may have differential impacts on performance across different performance levels; future research should examine this.

Although the effectiveness of feedback has been demonstrated in numerous studies in the OBM field, possible differential effects of feedback due to different worker characteristics such as skill level and work experience have not been extensively investigated. To maximize the effectiveness of feedback, it would be beneficial to investigate possible interactions between various feedback characteristics and different worker characteristics. It is hoped that the current study will serve as a model for future investigations of such interaction effects.

Notes on contributor

Kyounga Lee is now at Daewoong Management Development Institute, Yongin, Gyeonggi-do, Korea.

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