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**PSYCHOMETRIC PROPERTIES OF THE TURKISH VERSION OF
THE QUESTIONNAIRE OF GROUP RESPONSIBILITY OF COOPERA-
TION IN LEARNING TEAMS**

**Öğrenme Gruplarında Grup Sorumluluğu ve İşbirliği Ölçeği'nin
Türkçe Versiyonun Psikometrik Özellikleri**

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Abstract

The Questionnaire of Group Responsibility of Cooperation in Learning Teams (CRCG) was developed to assess university students' responsibility and cooperation skills in learning teams. The presented study aims to develop a Turkish version of the CRCG and to analyze its psychometric properties. The original scale was translated into Turkish and back-translated into English. Participants consisted of 231 (152 women, 79 men) university students. Cronbach's alpha of this questionnaire was high, indicating excellent internal consistency. The temporal reliability of the Turkish version of the CRCG and its convergent validity with the Dimensions of the Learning Organization Questionnaire was acceptable. The confirmatory factor analysis results pointed out that the two-factor structure of the test provided valid results. Taken together, all these results indicate that the questionnaire has good psychometric characteristics. As a result, the Turkish version of CRCG enables researchers and professors to measure students' responsibility and cooperation skills in learning teams.

Keywords: Cooperative Learning, Responsibility, Cooperation, Teamwork, Scale

Öz

Bu çalışmanın amacı León del Barco, Mendo-Lázaro, Felipe-Castaño, Fajardo-Bullón, ve Iglesias-Gallego (2018) tarafından geliştirilen Öğrenme Gruplarında Grup Sorumluluğu ve İşbirliği Ölçeği'nin psikometrik özelliklerinin incelenerek Türkçe'ye uyarlanmasıdır. Çalışmaya Çankaya Üniversitesi'nin farklı bölümlerinden, 18-49 yaş aralığından oluşan 231 kişi (152 kadın, 79 erkek) katılmıştır. Veri toplama araçları olarak, Öğrenen Örgüt Boyutları Ölçeği ve Öğrenme Gruplarında Grup Sorumluluğu ve İşbirliği Ölçeği kullanılmıştır. Ölçeğin Cronbach alfa katsayısı .93, yapı geçerliliği ve test-tekrar test tutarlılığı değerleri yeterli olarak bulunmuştur. Doğrulayıcı faktör analizi sonucu, ölçeğin iki faktörlü yapısını desteklemektedir. Elde edilen bulgular ölçeğin psikometrik özelliklerinin iyi olduğunu ve öğrenme gruplarında sorumluluk ve iş birliği becerilerinin değerlendirilmesinde kullanılabileceğini göstermektedir.

Anahtar kelimeler: İşbirlikli Öğrenme, Sorumluluk, İşbirliği, Grup Çalışması, Ölçek

1. Introduction

Cooperative learning is a method in which people study in learning teams during an assignment or a task (Felder & Brent, 2007). Rather than teachers having the role of transferring knowledge to students and learners to passively receiving information, the cooperative learning method includes active interaction among students (McDonald, Larson, Dansereau, & Spurlin, 1985). When students engage in

cooperative learning, their academic success increases (Slavin, 1980). According to Yager, Johnson, and Johnson (1985), students in cooperative learning teams show higher academic achievements than those who are learning in an individualistic manner because they would support and help each other. These findings indicate that the processes of supporting and helping others in group work are exceptionally beneficial for learning.

Several approaches have been put forward to understand the relationship between cooperative learning and general achievement. One of those, the motivational approach, suggests that these achievements positively correlate with the group's success. Students want other group members to learn the topic since their individual success is related to the group's overall success. (Slavin, 1996). On the other hand, social cohesion theorists claim that the motivation behind helping behavior in groups is nothing but the concern about the group as a whole. Students will wish for other students' success in learning the topic as they value them and their success. Thus, social cohesion theorists refuse the individualistic emphasis on evolution within the group (Slavin, 1996).

Another perspective, which is the cognitive one, introduces that students' success and achievements increase through their relationship with each other due to enhanced cognitive processing of information instead of motivational reasons (Slavin, 1996). Nevertheless, it is also important to emphasize that the effects of cooperative learning change from one person to another. It has been demonstrated that cooperative learning is likely to affect people with high cognitive skills and social orientation (Hall et al., 1988). All of these theoretical perspectives support the idea that the individuals who are socially interactive in working groups demonstrate higher achievements (León del Barco, Mendo-Lázaro, Felipe-Castaño, Fajardo-Bullón, & Iglesias-Gallego, 2018).

1.1. Cooperative Learning in University Settings

Group work is a common learning approach that promotes collaborative skills and enhances productivity to generate measurable outputs (Burdett, 2006). According to León del Barco et al. (2018), there is a need for new learning methods such as cooperative learning to strengthen students' autonomous learning. In learning teams, individuals consider both theirs and all the other group members' benefits while working together (Smith, 1996). Thus, cooperation is predominant for cooperative learning. Cooperation is helping other group members, providing assistance about group work, and offering ideas that could uplift the group work (Johnson, Johnson, Holubec & Holubec, 1994). According to Smith (1996), cooperative learning can be utilized in different ways, such as informal cooperative groups (e.g., small and short-term learning groups) and formal cooperative groups (e.g., task-oriented and long-term learning groups), among the latter being more structured. It is pointed out that all of these applications enable students to be intellectually active

and individually interactive. Numerous studies have demonstrated that cooperative learning enhances students' academic success more than individualist or competitive learning. Moreover, it increases the quality of the relationship formed with faculty members. Besides, cooperative learning promotes students' psychological adjustment and improves their self-esteem, which is essential for students' psychological health (Smith, Sheppard, Johnson, & Johnson, 2005).

Furthermore, students working in groups have a better conceptual understanding than individualistic ones. It is proposed that being in discussions and debates with their groupmates improves their critical thinking and problem-solving abilities (Gaudet, Ramer, Nakonechny, Cragg, & Ramer, 2010). In terms of improving transversal competencies, implementing cooperative learning at universities is a useful technique for students. It helps to develop critical thinking, enables students to gain cooperation, interdependency, and group work (León del Barco et al., 2018). Despite several advantages of cooperative learning, it is still hard to be sure about its efficacy and success. According to Buchs, Gilles, Antonietti, and Butera (2015), it is challenging for professors to control the learning environment in class with a higher effort and personal involvement in university settings. Another factor affecting group performance is group potency, which is defined as a collective belief about the group's effectiveness, shared by all its members. Besides, some motivational constructs related to group potency that can influence the success and the feeling of being a part of a group are self-efficacy and collective efficacy. While self-efficacy is an individual's belief about that individual's performance, collective efficacy is an individual's own belief about the group's effectiveness but not necessarily shared by others (Guzzo, Yost, Campbell, & Shea, 1993).

Another critical point is that the concept of responsibility which is an essential criterion for the group's achievement. Responsibility is taking liability for an individual to solve the task of the group (Varga & Vidra, 2011). Greater responsibility is transferred to individuals in a team when they are delegated authority to create their own learning environment and make their own decisions (Buchs, Filippou, Pulfrey, & Volpé, 2017). Thus, students should be aware that they depend on other group members and perform their best to get successful outcomes (León del Barco et al., 2018). If the students know that their team members are responsible for all their actions, they will work harder for their group (León del Barco, Mendo-Lázaro, Felipe-Castaño, Polo del Río, & Fajardo-Bullón, 2017). On the contrary, if social loafing or diffusion of responsibility which refers to people feel less responsible for their task when they work with a group of people than they do it alone (Forsyth, Zyzniewski, & Giammanco, 2002), other students may consider their efforts futile (Webb, 2009). Thus, positive interdependence is necessary to be successful in learning groups. As a result, students should perceive their inability to succeed unless other members also do so (Smith, 1996). The mechanisms of interdependence and responsibility provide the group environment's commitment and trust and enhance

the team's effectiveness (León del Barco et al., 2017). It is vital to prepare students for cooperative learning and explain why and how to interact collaboratively because students are not likely to be ready for cooperation initially. Thus, the above-mentioned preliminary preparation will help students feel more competent and enhance their learning outcomes (Buchs et al., 2015). Thus, it is crucial to support students in taking care of the possible problems they may face in the group work and monitoring whether the task is actually implemented effectively, fair, and equal or not (Burdett, 2006). Taken together, it is necessary to understand the factors of cooperation and responsibility in group work which are critical elements of cooperative learning (León del Barco et al., 2018).

1.2. The Present Research

Cooperative learning enhances daily achievement, problem-solving ability, and long-term retention of information (Johnson, Johnson, Stanne, & Garibaldi, 1990). When students work in a learning team where members hold the skill of cooperation and the commitment of responsibility, learning is enhanced (Johnson & Johnson, 1987). Thus, responsibility and cooperation are the essential elements of cooperative learning (León del Barco et al., 2018). Team conflict is one of the reasons that the learning teams are unsuccessful. Lack of responsibility is the primary source of conflicts within teams (Del Canto et al., 2009). Free-rider attitudes and social loafing reflect the lack of responsibility in these teams. According to Kerr and Bruun (1983), free-rider attitudes decrease group motivation and productivity. Moreover, social loafing is a phenomenon that occurs when individuals working together in a group put less effort into the task than in a case in which they work alone (Jackson & Williams, 1985). It is suggested that when the individual contributions to the task cannot be evaluated, and personal involvement in the task is not meaningful, individuals tend to engage in social loafing (Karau & Williams, 1993). To deal with conflicts that are stemmed from free-rider attitudes, an assessment of responsibility should be provided to teachers and researchers (León del Barco et al., 2018).

Additionally, according to León del Barco et al. (2018), in occupational contexts, applicants who have professional experiences and collaborative skills are more likely to be hired to work in multidisciplinary teams due to their collaborative skills. Thus, similarly, a questionnaire measuring cooperation skills can inform teachers about students' teamwork and conflict resolution abilities. To do so, creating a questionnaire to measure one's levels of responsibility and cooperation in learning teams is very crucial (León del Barco et al., 2018). The Questionnaire of Group Responsibility of Cooperation in Learning Teams (CRCG; León del Barco et al., 2018) was constructed to assess university students' responsibility and cooperation skills in learning teams. This questionnaire aims to inform teachers and researchers about learning teams working in cooperation and other group learning forms in university set-

tings (León del Barco et al., 2018). Furthermore, this questionnaire will provide information about evaluating the learning group members' responsibilities and cooperation skills quickly and simply (León del Barco et al., 2018). The CRCG has substantiated good psychometric characteristics, i.e., it shows satisfactory internal consistency and temporal reliability (León del Barco et al., 2018). It is reported that in Turkey, the cooperative learning method has been a preferred option for teaching in recent years (Yıldız, 1999). Moreover, cooperative learning has become an essential practice in Turkish universities. Also, responsibility and cooperation are shown to be the basics of cooperative learning (León del Barco et al., 2018). However, a valid scale that measures responsibility and cooperation in cooperative learning tested in a Turkish sample is missing. Thus, a questionnaire measuring responsibility and cooperation in learning teams became a necessity for Turkish university students' learning environment since both responsibility and cooperation are essential for learning teams. In addition, it has been shown that CRCG is an appropriate questionnaire for a quick and valid evaluation of responsibility and cooperation elements of cooperative learning (León del Barco et al., 2018). Hence, the present study aims to develop a Turkish version of the CRCG and analyze its psychometric properties in a Turkish university sample. Instead of creating a new scale, the CRCG was adapted to Turkish because it is recommended that valid and reliable scales should be preferentially used for a given construct rather than a new test is developed (Furr, 2011).

2. Method

2.1. Participants

Participants were 231 students (152 women, 79 men) from Çankaya University with an age range between 18-49 ($M = 21.48$, $SD = 2.64$) in the current study. A convenient sampling technique was used to select the participants.

2.2. Materials

The Questionnaire of Group Responsibility and Cooperation in Learning Teams (CRCG). The CRCG (León del Barco et al., 2018) is a 14-item self-report questionnaire that is rated on a 5-point Likert-type scale from 1 (never) to 5 (always). The questionnaire includes two dimensions: responsibility and cooperation (León del Barco et al., 2018). The responsibility dimension has 8 items evaluating the group members' capability of fulfilling the group's aims and liabilities (León del Barco et al., 2018). The cooperation dimension has 6 items evaluating the group members' efforts to achieve the group's goal with the interaction among group members (León del Barco et al., 2018). Cronbach's alpha coefficients were found as .91 for responsibility, and .84 for cooperation, indicating good internal consistency (León del Barco et al., 2018). The total score of CRCG can be computed by the sum of all 14 items.

The Dimensions of the Learning Organization Questionnaire (DLOQ). The DLOQ (Watkins & Marsick, 1997) is a 49-item self-report questionnaire that

assesses learning activities within organizations. The items are rated on a 6-point Likert-type scale from 1 (almost never) to 6 (almost always) (Watkins & Marsick, 1997). The DLOQ has seven dimensions: continuous learning, inquiry and dialogue, collaboration and team learning, embedded systems, empowerment, system connections, and leadership (Watkins & Marsick, 1997). The continuous learning dimension has 7 items, whereas all the other dimensions have 6 items (Watkins & Marsick, 1997). The DLOQ was adapted into Turkish by Basim, Şeşen, and Korkmazürek (2007). Cronbach's alpha coefficient of the scale was reported as .88, demonstrating good internal consistency (Basim et al., 2007). In this study, the DLOQ was used for convergent validity analysis.

2.3. Procedure

The required permission to translate the CRCG was taken from the first author of the questionnaire. The study was approved by the Çankaya University, Social and Humanities Scientific Research and Publication Ethics Committee. All participants voluntarily participated in the study. The questionnaires were applied by using a paper format. Participants were given the informed consent and the demographic form, including gender and age information. DLOQ was applied to all participants in order to examine the convergent validity of CRCG. To ensure anonymity, all participants were assigned a code number. In order to ensure the reliability of the Turkish version of CRCG, the same test was re-administered to 61 of the participants after 25 days.

2.4. Forward-Backward Translation

After the required permission was obtained, two translators performed the forward translation of the CRCG from English to Turkish. The translators' mother tongue was Turkish. The first translator was an English lecturer. The second translator was an assistant professor in the psychology department from Çankaya University. Both translators were informed about the terminology in the questionnaire. Two additional translators performed the backward translation of the CRCG from Turkish to English. The translators were an English lecturer and an assistant professor in the psychology department from Çankaya University. They were also informed about the terminology of group work.

2.5. Data Analysis

Data were analyzed by using SPSS 25 (Statistical Package for the Social Sciences). First, Cronbach's alpha coefficients for internal consistencies of the scales and test-retest reliability analysis were analyzed. Next, Pearson correlation coefficients were measured for convergent validity analysis. Finally, a second-order confirmatory factor analysis (CFA) was administered for testing construct validity by using Jasp 0.14.1.0 software with the direct maximum likelihood (ML) method after the multivariate normality assumption was verified. The ML method was selected because of its attractive statistical properties such as asymptotic unbiasedness and normality (Li, 2016).

3. Results

3.1. Convergent Validity Analysis

Since both CRCG and DLOQ could be used to assess individuals' learning activities including responsibility and cooperation in groups, the Pearson correlation coefficient between the Turkish version of CRCG and DLOQ was calculated to examine the convergent validity of the CRCG. It has been found that CRCG was significantly and positively associated with DLOQ ($r = .66, p < .001$). This result suggests that the Turkish version of CRCG has good convergent validity.

3.2. Reliability Analysis

The internal consistency of the Turkish version of CRCG (for means and standard deviation, see Table 1) was analyzed with Cronbach's alpha and McDonald's ω coefficients. The Cronbach's alpha coefficients are calculated as .93 for the Turkish version of CRCG, .86 for the responsibility dimension, and .92 for the cooperation dimension. The McDonald's ω coefficients are .93 for the Turkish version of CRCG, .86 for the responsibility dimension, and .92 for the cooperation dimension.

Table 1. Means and (standard deviations) of the Turkish version of CRCG

	Test (SD)	Mean	Retest (SD)	Mean
Responsibility	3.68 (0.87)		3.70 (0.78)	
Cooperation	3.70 (0.88)		3.80 (0.76)	
Total	3.70 (0.83)		3.75 (0.74)	

A total of 61 participants (54 women, 7 men) were tested twice by the same testers with a 25-days interval to assess test-retest reliability. The mean age of these participants was 22.18, and the standard deviation was 3.73. The same participants completed the test and the retest. Test-retest correlation of the Turkish version of CRCG was acceptable ($r = .77, p < .001$). In addition, both responsibility and cooperation dimensions have acceptable test-retest correlations as $r = .73$ and $r = .72$, respectively ($p < .001$).

3.3. Factor Analysis

The two-factor structure (see Figure 1) of the Turkish version of CRCG was examined by the second-order confirmatory factor analysis. Each of the overall goodness-of-fit indices suggested that the two-factor model fit the data well, $\chi^2 (75) = 153.15$, SRMR = .03, RMSEA = 0.07 (see Table 2 for all fit indices).

Table 2. Confirmatory factor analysis results for the two-factor model of CRCG

Fit Indices	Fit Range	Two-dimensional Model
Total Fit Index		
χ^2 / df	$0 \leq \chi^2 / df \leq 3$	153.15/75 = 2.04
Comparative Fit Index		
NNFI	$\geq .95$.96
CFI	$\geq .95$.97
TLI	$\geq .95$.96
RMSEA	≤ 0.08	0.067
Absolute Fit Index		
GFI	$\geq .90$.91
Residual Based Indexes of Compliance		
SRMR	$0 \leq - \leq .08$.03

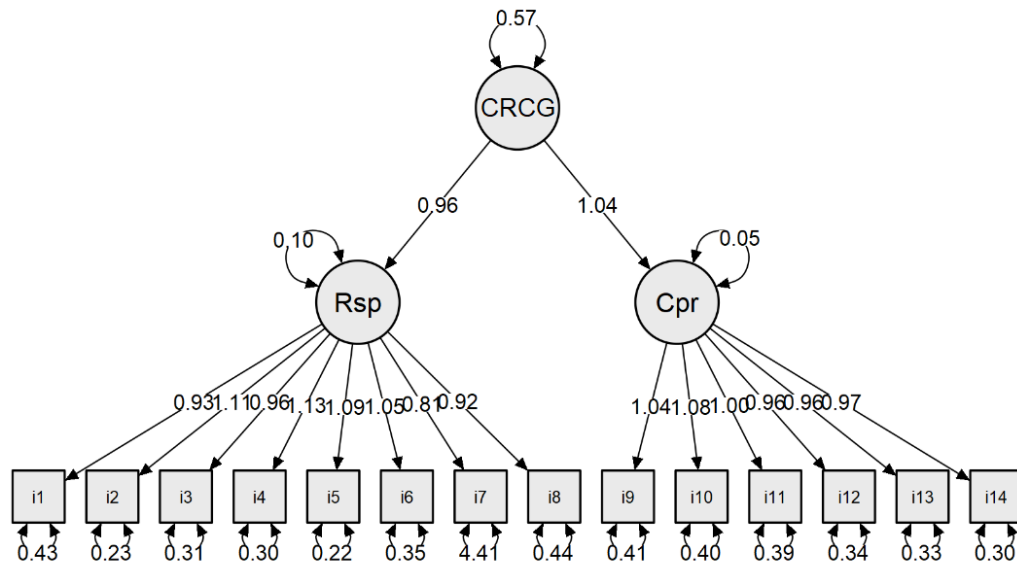


Figure 1. The model plot of the two-factor structure of CRCG.

Notes: Rsp stands for responsibility, Cpr stands for cooperation, and i stands for item.

Tukey’s test for non-additivity was employed to determine whether the CRCG was summable or not. The results indicated that all items in the scale were summable ($F = 1.90, p = .17$).

4. Discussion

The goal of this study was to develop the Turkish version of CRCG and analyze its psychometric properties. The sample of the study was composed of university students from Çankaya University in Turkey. The psychometric evaluation of the Turkish version of CRCG included examining internal consistency, test-retest reliability, convergent validity, and confirmatory factor analysis of the scale.

The results suggest that the Turkish version of CRCG demonstrated good psychometric characteristics, and the psychometric properties of the Turkish version of CRCG are consistent with the original CRCG. It has sufficient internal consistency and test-retest reliability. The Cronbach's alpha coefficient of the Turkish version of CRCG was .93, indicating good internal consistency. The Cronbach's alpha coefficient of the original CRCG was .92 (León del Barco et al., 2018). Thus, the obtained Cronbach's alpha coefficient of the Turkish version of CRCG was compatible with the Cronbach's alpha coefficient of the original CRCG. The temporal reliability of the original CRCG was acceptable ($r = .77$) (León del Barco et al., 2018). Similarly, the Turkish version of the CRCG's temporal reliability is also acceptable ($r = .77$). Moreover, it has been demonstrated that the Turkish version of CRCG had acceptable convergent validity with DLOQ. The results of the confirmatory factor analysis show that the two-factor structure of the test was validated. Thus, the first eight items and the rest six items in the CRCG generated the responsibility and cooperation factors. In addition, the responsibility and cooperation factors contributed strongly to CRCG.

Cooperative learning refers to group of students' responsibly and cooperatively work together to achieve a goal or to complete a task (Har, 2005). Furthermore, cooperative learning enhances students' enhancement of learning and academic achievement by using a variety of learning techniques (Balkcom, 1992; Slavin, 1983). In addition, cooperative learning was demonstrated to be gaining more interest in the world, especially in the USA (Timur, 2006). This trend has also been observed in Turkey (Dirlikli, Aydın, & Akgün, 2016), and cooperative learning becomes one of the common practices in the Turkish education system nowadays. On the other hand, group works sometimes cause some disadvantages such as diffusion of responsibility and social loafing (Hardy & Latane, 1988). It is important to measure the degree of responsibility and cooperation within a group in order to eliminate the effect of diffusion of responsibility effect. We believe that the present study could make several contributions to the cooperative learning literature in Turkey. Since both responsibility and cooperation are shown to be the basic elements of cooperative learning (León del Barco et al., 2018), a questionnaire that measures responsibility and cooperation in learning teams is necessary for learning environments for the Turkish population. This questionnaire enables researchers to measure one's being responsible and cooperative in learning teams and one's perspective regarding these issues. The Turkish

version of CRCG can be considered an efficient, fast, and simple tool to assess students' levels of responsibility and cooperativeness in university settings.

In conclusion, our findings suggest that the Turkish version of CRCG is a reliable and valid scale to understand and predict students' cooperation and responsibility skills. Since the Turkish version of CRCG is one of the available measurement tools with good psychometric properties related to responsibility and cooperation in group work, it may be used in future studies to use measure group learning, the responsibility of the group members and cooperation within the group. Moreover, it has been investigated that how cooperative method of learning could relate to the development of interpersonal and social competencies of university students as well as their teamwork and professional competencies (Mendo-Lázaro et al., 2018). Thus, future researchers can use CRCG to assess how students' cooperative skills change with the inclusion of cooperative learning strategies in educational settings. Then, it is recommended to use CRCG to assess how student's cooperative skills change over time. While doing so, then, rather than merely measuring students' cooperative skills, CRCG also becomes a tool which is assessing the role of the particular cooperative learning method in the development of those skills in students and whether that particular method is in need of improvement. This questionnaire can be used to assess responsibility and cooperation in group works in Turkish universities. Moreover, the usage of the Turkish version of CRCG in learning teams can enhance students' awareness about importance of responsibility and cooperation. If students understand their teammate's efforts including responsibility and cooperation, the efficacy of group work and cohesion among group members can be strengthened (León del Barco et al., 2018). All in all, we hope that the current study will help to enhance the effectiveness of group learning.

4.1. Limitations

There were some limitations that should be considered in the present study. Even though the Turkish version of CRCG showed acceptable convergent validity, the construct validity of the Turkish version of CRCG was not sufficiently proven since the divergent validity of the Turkish version of the CRCG was not demonstrated. Moreover, the present study's findings could have generalizability problems due to the sampling method and sample size. Data were collected only in Çankaya University by convenient sampling method. Since it is a non-random method to select participants, it could lead to bias in data collection. Also, the sample size of the present study was small, indicating low generalizability. In addition, the gender distribution of the sample was inequivalent. Future research should consider the potential effects of gender more carefully. Furthermore, most of the retest data were collected from the students of the psychology department. During the interval between test and retest, it was possible that the students might engage in several stressful group tasks, which might affect the participants' previous thoughts on working in groups.

As a result, this might decrease the correlation between test-rest results. Finally, although consistent results were obtained between the Turkish versions of CRCG and DLOQ, the following issues should be considered. The original version of the DLOQ analyzes the group work capability in workplaces. Necessary changes in words were made in order to adapt the questionnaire to university settings. As a consequence of these word changes, participants' understanding of the items of the DLOQ might be negatively affected.

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