

Conceptual Article

Recommendable positive-to-negative interaction ratio for teachers

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Although teacher education programs instruct future teachers to utilize both reinforcement and punishment efficiently in their classrooms, the real effectiveness of them is different. Previous research has already found that praising students related to positive outcomes and punishing them related to negative outcomes in classroom management. Currently, there are several recommended positive (e.g., praise) to negative (e.g., reprimand) interaction ratios for teachers (e.g., 4:1, 5:1) to have an effective classroom management. Through investigating the extant studies, this paper considered whether such a critical ratio exists in positive-to-negative interaction for teachers to create effective teaching and classroom management, and the conclusions were provided.

Keywords: Positive-to-negative interaction ratio, Praise, Reprimand, Classroom management, Pedagogy

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According to educational psychology textbooks, students in teacher preparation programs are taught both reinforcement and punishment strategies for effective classroom management (e.g., Santrock, 2008; Snowman & McCown, 2013; Vialle et al., 2005). Yet, their actual effectiveness for classroom management in real classrooms is different.

Research has found that praising students has been linked to a decrease in inappropriate behavior and tardiness and increase students' on-task behavior (Royer et al., 2019). Indeed, giving positive feedback toward students (e.g., specific praise) has been reported to be one of the recommended evidence-based practices for better classroom management (Simonsen et al., 2008). Specific praise means giving a positive statement toward the student who conducted the specific action. In real classrooms, teachers tend to use general praise more often than specific praise (Floress et al., 2018). Yet even the usage of general praise, instead of a specific one, has been found to be effective for elementary school teachers' classroom management (Reinke et al., 2013).

However, punishment (e.g., reprimand) seemed neither to decrease the punished behavior nor to increase the academic engagement of middle school students in the future (Caldarella et al., 2021a). One of the reasons why punishments do not decrease the future occurrence of the punished behavior is that it does not teach students what an appropriate behavior is (Vialle et al., 2005). Moreover, harsh reprimands are positively related to the emotional exhaustion of elementary school teachers (Reinke et al., 2013). Collier-Meek et al. (2019) reported that class-wide academic engagement was positively correlated with specific praise and negatively correlated with reprimands in kindergarten and elementary school samples. Similarly, Wills et al. (2019) found that in an academic engagement of middle school students at both individual- and class-wide levels increased with the increase of praise and decrease of reprimands by teachers.

Nevertheless, teachers tend to pay more attention to inappropriate behavior of students with punishment than appropriate behavior with praise in real classrooms (Shores et al., 1993). For example, a naturalistic

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observational study reported that teacher's approvals were high in both the first and 2nd graders, but they dropped from the 3rd to 12th grade, and the teacher's disapprovals appeared more frequently than the approvals from 3rd graders to the 12th graders (White, 1975). Another naturalistic observational study of ethnically diverse 7th graders in New Zealand also found the similar result: teachers were more likely to send disapproval messages than those of approval to their students (Thomas et al., 1978). A more recent naturalistic observational study also found that teachers' usage of praise was very low in kindergarten and elementary schools (Floress et al., 2018).

Such a negativity bias is not a peculiar phenomenon that was found in the field of education only. Indeed, psychologists have already found negativity bias in many different domains of human life. Negativity bias can be defined as humans tend to pay more attention to negative information than that of positive and the magnitude of psychological effects on the human mind of negative information is larger than that of positive (Baumeister et al., 2001; Boniwell & Ryan, 2012; Rozin & Nemeroff, 2002; Rozin & Royzman, 2001). For example, losing of \$100 than winning of \$100, losing an extant friend than gaining a new friend, and receiving criticism than receiving praise, have stronger psychological effects on the human mind. In order to overcome the psychological power of negative information, positive information needs a greater number of its comrades (Baumeister et al., 2001). Therefore, teacher should have more numbers of positive interactions than negative ones with their students for better classroom management.

If praise is found to be effective and punishment found to be ineffective in real classrooms, why not use only praise without any reprimands? Primarily all-positive interactions (e.g., praise) without any negative interactions could be effective classroom management strategy with (a) an expense of much preparation time and efforts of teachers (e.g., using high rates of praise, selecting appropriate level of tasks, choosing appropriate rewarding words to each student) and with (b) an establishment of high rates of appropriate behavior by using both praise and punishment before administering the primarily all-positive approach. Therefore, it is unrealistic for many teachers who have many classes with many students and live on a busy schedule. In addition, any good student can make mistakes. Thus, the primarily all-positive approach requires some reprimands in order to be effective (Piffner et al., 1985; Piffner & O'leary, 1987). Another recent empirical study also reported low rates of error correction were significantly related to class-wide academic engagement (Collier-Meek et al., 2019). Thus, praise requires punishment that occurs less frequently than praise itself in order to be an effective tool for classroom management.

Indeed, empirical studies had already indicated the positive-to-negative interaction ratio between teachers and students (PN ratio) was linked to various factors of teachers and students. Reinke et al. (2013) found that the PN ratio was negatively related to the emotional exhaustion of elementary school teachers. Sutherland and Wehby (2001) reported that the PN ratio was positively correlated with the correct academic responses of students with emotional and behavioral disorders. Reinke et al. (2016) reported that the PN ratio was positively related to prosocial behavior and negatively related to concentration problems, emotion dysregulations, and disruptive behavior of students from kindergarten to 3rd grade. Cook et al. (2017) reported the PN ratio positively related to academic engaged time and negatively related to disruptive behavior problems. Leff et al. (2011) found that the lower PN ratio was associated with higher level of relational and physical aggression, and noncompliant and disruptive behavior, and the higher PN ratio was associated with students being "liked most" nominations by fellow students and the mean class-wide level of enthusiasm and focus.

So, what is a recommendable ratio of PN ratio for teachers in order to have an effective classroom management? Some scholars had already proposed 4:1 (e.g., Lewis & Sugai, 1999; Perle, 2016; Reinke et al., 2013; Trussell, 2008) and others stated 5:1 (e.g., Cook et al., 2017; Flora, 2000).

Sabey et al. (2019) had already answered that question eloquently in their paper. According to them, teachers should not aim for a specific PN ratio, even though the PN ratio should be kept in high. In considering the critical PN ratio, there are some problems. First, there are no universal definitions for praise and reprimands so that it is difficult to make a conclusion from the results of the relative studies (Caldarella et al., 2020; Sabey et al., 2019). Second, if a specific PN ratio, for example, 5:1 was assigned to teachers as their target, teachers may conduct maladaptive behavior in order to satisfy the ratio. For example, if a teacher reprimands someone once, he or she must praise someone five times in order to satisfy the quota. In order to satisfy the quota, he or she may praise other students who were not reprimanded or the reprimanded student who did something to a much lower standard (e.g., a behavior that is too easy for his or her age). Third, a student will learn that conducting inappropriate behavior is more rewarding than an appropriate one because the former brings five future positive comments from the teacher and the latter one brings only one. Sabey et al. (2019) pointed out the fundamental problem of setting a critical PN ratio for teachers by

writing “Teachers are responding to a rule than to student behavior.” (p. 160). Indeed, a teacher should respond to his or her students, instead of a certain rule, to ensure optimal student and teacher interactions. I also agree with them that teachers are “strive for increasing the PN ratio by being responsive to how the students perform” (p. 160). Indeed, Sabey et al. (2019) answered the question thoughtfully and logically, and I recommend the readers to refer to their complete arguments in their original paper.

Although there were no (or few) studies that empirically studied the existence of a critical PN ratio before the publication of Sabey et al. (2019), such new studies were published recently by Caldarella and his colleagues (2019, 2020, 2021b). These empirical studies of Caldarella and his colleagues (2019, 2020, 2021b) are important to consider the issue of a recommendable specific PN ratio for teachers because these studies dealt with different students (high-risk students for emotional and behavioral disorder vs. peer students, elementary school students, and middle school students) and with relatively large-size data (540 students, 2,536 students, and 628 students, respectively). Caldarella and his colleagues (2019, 2020, 2021b) tried to answer the question: whether there is a critical (or optimal) PN ratio that dramatically improves target behaviors of students or not. Through conducting multivariate regression analyses, they found very similar results from the three different samples. Although there were linear relationships between a PN ratio and various student outcomes, there were no critical (or optimal) PN ratios for any of the target outcomes in their studies. Caldarella and his colleagues (2020) wisely stated it is possible that future research which utilizes more diverse samples with more statistical power could find critical (or optimal) PN ratios. Thus, we cannot say that there are no critical (or optimal) PN ratios for particular outcomes of instruction. Nevertheless, we can say that empirical studies that are available up to 2022 could not find such ratios.

Finally, I searched for the same issue in the Japanese-language research literature but could not find any empirical studies about the recommendable PN ratio. However, I could find an old saying about the issue. The old saying goes like this, “*kawaikuba itsutsu oshiete mittsu homete futatsu shikarite yokihito ni seyo* [If you love your students, teach (them) five (contents), first praise (them) three (things) and then reprimand (them) two (things) in order to make them good people]” (Kimura, 1998). This statement reminds me of the study of Pisacreta et al. (2011). In this study, teachers who were trained to maintain at least a 1:1 PN ratio could decrease disruptive behavior of students to manageable levels.

It seems to me that the current understanding of empirical studies and the old saying in Japan are synergically delivering the same message. With different students in sex, age, disability-status, language, and culture, and teaching different subjects in different class sizes, there is probably no specific PN ratio that can be recommended to teachers in general (Caldarella et al., 2020; Sabey et al., 2019). Due to negativity bias, the psychological effects of reprimands are stronger than those of praise. Therefore, teachers should praise their students more than reprimand them. Instead of setting a specific PN ratio, teachers should praise more than reprimand them in order to ensure optimal teaching and learning in his or her class. There might be a critical PN ratio for each class, but probably it can be discovered by each teacher.

Finally, let me list the three conclusions of this paper below.

1. There is probably no specific PN ratio that can be recommended to teachers in general.
2. Teachers should praise their students more than reprimand them.
3. The critical PN ratio in order to create optimal teaching and learning in a particular class can be found by the teacher who instructs that class, not by someone else.

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