Interpersonal Relationship, Self-efficacy and Learning Motivation of the High School Students in Guangzhou

Yuan-Cheng Chang

Abstract
This study aimed to investigate the effect of interpersonal relationship and self-efficacy on the learning motivation of high school students in Guangzhou, China, and the mediation effect of self-efficacy in the COVID-19 period. That four high-schools were in Guangzhou selected to carry out the investigation, with 400 students selected and 385 effective samples generated. Results have shown that both interpersonal relationship and self-efficacy can induce the learning motivation of high school students in Guangzhou. Interpersonal relationship of the students promotes the senses of self-efficacy, while self-efficacy of the students renders a mediation effect between the interpersonal relationship and learning motivation. Having come under the impact of COVID-19 and gone through the closed-off management of the city, the high school students in Guangzhou proactively interacted with their schoolmates and teachers after rejoining school, to fulfill their interpersonal relationship and demonstrated good motivation.

Introduction
In early 2020, due to the COVID-19 pandemic, most schools around the world were closed, which created a serious impact on the global education environment (World Bank, 2020). This May in China, with the pandemic abating, schools were gradually reopened in various regions (BBC News, 2020). However, students were required to practice social distancing back to school. Prior to this, they were subjected to extreme anti-COVID-19 measures such as lockdown restrictions, closed-off management, and home isolation. Whether these experiences have an effect on the psychological aspect particularly interpersonal relationship and learning motivation of students is a topic worth exploring. As many scholars have suggested that both interpersonal relationship and self-efficacy have a positive effect on students’ learning motivation (Anam & Stracke, 2016; Pajares, 2008; Yulikhah, et al., 2019; Zimmerman, 2000).

Interpersonal interactions play a pivotal role in adolescent development. Starting from adolescence, children gradually become less dependent on their parents while turning to seek recognition from their peers. Sound relationships with their family members and peers can help adolescents develop positive values and attitudes (Gilmore & Meersand, 2013). Moreover, strong interpersonal relationships help relieve stress, provide emotional support in daily life, offer companionship in joint activities, and lay the foundation for social and emotional development (Martin, 2014; Martin & Dowson, 2009). According to Mellor et al. (2008), teacher–student and peer relationships are the primary interpersonal relationships of students, and are considered important environmental factors in learning. Additionally, teachers and classmates offer critical psychological support and a sense of protection (Waters et al., 2014). As environmental and psychological stress may be cushioned by interpersonal relationships such as peer interactions and teacher–student interactions, individuals derive a sense of participation and satisfaction from groups, which in turn generates a positive effect of learning (Arslan, 2012; Kiuru et al., 2020; Wentzel, 2012).

As proposed by Bandura (1997), the concept of self-efficacy refers to the belief in one’s competence or ability to successfully accomplish a task. People usually undertake what they consider within their ability (Schunk & Miller, 2002; Ormrod, 2008). Those with higher levels of self-efficacy believe in their ability to complete challenging tasks (Bandura, 1994). Moreover, Bandura (1994) suggests that human behavior is driven by the interplay of self-efficacy and outcome expectancy. The former refers to people’s judgments about their ability to successfully complete or perform a specific task under specific circumstances, while the latter refers to the judgments about the possible outcome this performance may bring. Bandura (1977) shows that people’s judgments of self-efficacy differ in three aspects: magnitude (level), generality, and strength. Magnitude indicates that each individual has different perceptions about the difficulty level of a task in forming their self-efficacy beliefs. Generality refers to “the degree to which a self-efficacy belief in a task can be generalized in a series of similar activities across areas of the same or other functions” (Moradkhani, 2009). Further, each
individual has different degrees of self-efficacy. Those with strong conviction about their work ability appear tenacious when encountering difficulties, while those with weak conviction are more likely to quit in face of challenges. Therefore, when people consider that their behaviors can achieve a favorable outcome, they perform the behaviors needed for achieving that result (Rodríguez et al., 2014). Zhang and Ardasev (2019) shows that self-efficacy plays a significant role in learning processes and results. Tenable learners to engage more in terms of cognition, behavior, and motivation during the learning process (Garcia-Martín & García-Sánchez, 2018).

**Relationships among Interpersonal Relationship and Learning Motivation**

According to Williams and Burden, motivation is defined as “a state of temporary or prolonged goal-oriented behavior which individuals actively choose to engage in” (1997: 94). Pintrich and Schunk (2002) define motivation as “the process whereby goal-directed activity is instigated and sustained.” With their learning motivation and interest raised through various motivational activities, students may well invest their time and energy in the fulfillment of their pre-set goals (Nukpe, 2012). Tella (2007) also elucidates that motivation is an essential factor in learning. Without motivation, students are less likely to achieve satisfying learning results (Uno, 2010). Therefore, motivation gives humans energy and power while also providing guidance (Gilakjani et al., 2012). Motivation can be divided into intrinsic and extrinsic. Intrinsic motivation refers to “the motivation to engage in an activity because that activity is enjoyable and satisfying to do” while extrinsic motivation means “to achieve some instrumental ends, such as earning a reward or avoiding a punishment” (Gilakjani et al., 2012).

Positive interpersonal relationship serves as the foundation for many studies. Research has shown that interpersonal relationships has a beneficial effect on the academic and nonacademic competencies of youngsters (Martin & Dowson, 2009; Kuru et al., 2020). Positive interpersonal relationships between students and their parents, teachers, and peers facilitate healthy social, emotional, and intellectual functioning as well as positive feelings of self-worth and self-esteem (Martin & Dowson, 2009). Through interpersonal interactions, students can develop knowledge about themselves and acquire knowledge they need for adaptation to specific groups in schools or classrooms (Wentzel, 1999). Furrer and Skinner (2003) manifests that adolescents immersed in positive peer interactions display higher learning motivations. Moreover, if more engagement takes place between teachers and students, students are more attentive in class, displaying higher learning motivations (Kuh et al., 2005). This study proposes the following hypothesis 1: Interpersonal relationship has a positive effect on learning motivation.

**Relationships among Interpersonal Relationship and Self-efficacy**

In terms of academic relevance, through interpersonal interactions, students can develop effective beliefs, directions, and values in the academic environment (Ryan & Deci, 2000). These beliefs can reinforce students’ guiding behavior for goal striving and persistence (Wentzel, 1999). Therefore, self-efficacy is subject to the influence of external social contexts and interpersonal interactions (Bandura, 1997). Good interpersonal engagement helps students earn recognition from peers and teachers, fosters self-learning ability, and facilitate positive development. Students with stronger self-assertiveness can obtain more positive learning experiences and results than those with weaker self-assertiveness (e.g., establishing a positive working relationship with teachers) (Arslan, 2012; Chang & Bangsri, 2020; Pennings et al., 2018). Martin and Dowson (2009) also demonstrate that in an academic context, a good relationship with particular teachers may well result in students’ internalization of the teachers’ certain beliefs and values (Pennings et al., 2018). Additionally, students can develop self-efficacy beliefs through peer learning. This successful learning experience enables students to gain a more positive sense of self-efficacy (Arslan, 2012; Chang & Bangsri, 2020). Therefore, interpersonal relationship school has a profound effect on the self-efficacy beliefs of adolescent students. This study proposes the hypothesis 2: Interpersonal relationship has a positive effect on self-efficacy.

**Relationships among Self-efficacy and Learning Motivation**

The self-belief of students is a main constituent of learning motivation. Under this presumption, their true belief in creation, development, and persistence serves as the chief driving force for academic success or failure (Pajares, 2008). Self-efficacy is the main factor that influences the behaviors and motivations of individuals. The expected outcomes of their performance are mainly determined by their judgments about the possibility to cope with the situation at the time (Bandura, 1986; Zimmerman, 2000). Zhang and Ardasev (2019) also shows that self-efficacy plays a significant role in learning processes and results. It enables students to engage more in terms of cognition, behavior, and motivation during the learning process (Anam & Stracke, 2016; Panadero et al., 2017; Garcia-Martín & García-Sánchez, 2018). This motivational belief includes self-efficacy, intrinsic value, and test anxiety (Pintrich & Schunk, 2002). Moreover, individuals’ evaluation of self-efficacy has a causal effect on academic motivation (Zimmerman, 2000; Zimmerman & Martinez-Pons, 1986). Based on this, proposes the hypothesis 3: Self-efficacy has a positive effect on learning motivation.
This study is based upon the theoretical framework of social cognitive theory (SCT) as proposed by Bandura (1986). Bandura believes that learning is the dynamic and reciprocal interplay between person, environment, and behavior in a social context. SCT emphasizes that social influence and internal–external social reinforcement provide individuals with a unique way of acquiring and maintaining behavior. It also takes account of the social environment in which individuals perform their behaviors, and a person’s past experiences, which generate reinforcements and expectancies. All these factors affect whether a person will engage in a specific behavior and shape the reasons why a person engages in that behavior (Lewis, 2019). Bandura (1997) states that children acquire more experience and cognitive ability as they grow up. They give more accurate assessment of their own ability, with their efficacy belief of specific behaviors gradually formed and shaped. People develop appropriate methods to manage frequently occurring situations and act upon their perceived efficacy. They will only make changes for major experiences. When conventional behaviors fail to produce the expected outcomes, the cognitive control system reboots to formulate and test new models (Bandura, 1997).

**Relationships among Interpersonal Relationship, Self-efficacy, and Learning Motivation**

Bandura (1986) the degree to which individuals consider that they have the execution ability to produce expected results can explain and predict the motivations, judgments, and behaviors of individuals. That is, self-efficacy can explain an individual’s choice between whether to engage in or avoid an activity. Interpersonal relationships show an individual’s ability of socialization (Martin, 2014; Martin & Dowson, 2009). Positive interpersonal relationships stimulate oneself and activate positive emotions and influence (Furrer & Skinner, 2003). The energy obtained from positive interpersonal relationships provides a significant path to motivation and engagement (Furrer & Skinner, 2003; Kiuru et al., 2020; Martin & Dowson, 2009). Therefore, students learn from peer and teacher–student relationships to foster self-efficacy development—such as personal self-beliefs, values, and abilities (Martin & Dowson, 2009). When students develop a positive sense of self-efficacy and believe their ability in learning, they show higher motivation to engage in learning activities (Bandura, 1986; Panadero et al., 2017; Zimmerman, 2000). This study proposes the hypothesis 4: Self-efficacy renders a mediation effect between interpersonal relationship and learning motivation.

Guangzhou led China’s first-tier cities in implementing closed-off management in response to the COVID-19 pandemic. From January 13, 2020 through March 6, 2020, the Guangzhou Center for Disease Control and Prevention (GZCDC) reported 391 confirmed cases (244 cases in Guangzhou City and 147 cases in other regions) (Luo et al., 2020). With the epidemic subsiding in May, schools in Guangzhou gradually resumed classes. However, would the closed-off management during the pandemic affect the interpersonal relationship, self-efficacy, and learning motivation of students after schools reopened? Furthermore, adolescence is a critical period for the development of interpersonal relationship (Gilmore & Meersand, 2013). With the above literature review and on the basis of the high school students in Guangzhou in the COVID-19 period, this study aims to explore whether the interpersonal relationship of students could help enhance their self-efficacy and further increase their motivation to engage in learning.

**Research Methods**

**Research Framework**

The research framework of this study was constructed on the basis of the above literature discussion and the proposed research hypotheses (given below). Based on SCT, this study discusses the effect of interpersonal relationship and self-efficacy on the learning motivation of high school students, and the mediation effect of self-efficacy between interpersonal relationship and learning motivation. Data analysis and model verification were performed using the method of structural equation modeling. The research framework is shown in Figure 1.
Study Objects and Sampling Methods

This study focuses on discussing the effect of interpersonal relationship and self-efficacy on the learning motivation of high school students in Guangzhou. The questionnaire survey of this study was conducted from June 1, 2020 to June 20, 2020. Four high schools in Guangzhou, China, were selected through purposive sampling, with two classes drawn from each of the high schools, and 50 students drawn from each class. In total, 400 students were surveyed and 389 questionnaires were retrieved. With invalid questionnaires eliminated, a total of 358 valid questionnaires were obtained, with 128 male and 230 female respondents.

Research Instruments

The Chinese Campus Interpersonal Relationship Scale constructed by Xu et al. (2002) was employed as the interpersonal relationship scale, which includes seven questions for two dimensions: peer relationship (4 questions) and teacher–student relationship (3 questions). The 5-point Likert scale was used to assess the level of interpersonal relationship on a scale of 1 to 5 points. In terms of the reliability analysis of interpersonal relationship, the Cronbach’s α for peer relationship is .854, .842 for teacher–student relationship, and .889 for overall interpersonal relationship. All Cronbach’s α coefficients were higher than the criteria of .7.

Furthermore, confirmatory factor analysis (CFA) was conducted to test the interpersonal relationship scale. The factor loading for all questions in both dimensions lie between .687 and .847. The construct reliability (CR) values of peer relationship and teacher–student relationship were .854 and .919, respectively, exceeding the evaluative criteria of .60. The average variance extracted (AVE) values of the two dimensions are .596 and .619 respectively, exceeding the evaluative criteria of .50 (Fornell & Larcker, 1981). This indicates that the scale has a high level of discrimination. As for the goodness of fit test of the scale, the three aspects suggested by Hair et al. (2006) are taken as reference, namely “measures of absolute fit,” “incremental fit measures,” and “parsimonious fit measures.” The results are as follows: measures of absolute fit: χ²/df = 4.972, RMSEA = .088, GFI = .963, AGFI = .920, SRMR = .035 (Hu & Bentler, 1999); incremental fit measures: CFI = .972, IFI = .972, NFI = .963 (Bagozzi & Yi, 1988); and parsimonious fit measures: PNFI = .596, PGFI = .447 (Breivik & Olsson, 2001), which indicate that the scale has a satisfying goodness of fit.

The self-efficacy scale with 10 questions as proposed by Scholz et al. (2002) was adopted for estimating self-efficacy. The original survey (questionnaire) was written in English, which was then translated into Mandarin. In order to verify the accuracy of the translation, the Mandarin version of the survey was translated back into English by a translator. The 5-point Likert scale was used to assess the level of self-efficacy on a scale of 1 to 5 points. The reliability analysis, Cronbach’s α is .861. Therefore, the second question is deleted. In terms of CFA, the factor loadings of all questions lie between .428 and .782, with a CR of .865 and an AVE of .400. The goodness of fit test of the scale. Measures of absolute fit: χ²/df = 144.112, RMSEA = .093, GFI = .925, AGFI = .883, SRMR = .051; incremental fit measures: CFI = .911, IFI = .912, NFI = .887; and parsimonious fit measures: PNFI = .690, PGFI = .589.

For the learning motivation scale, Keller’s ARCS Model (1987) (ARCS stands for Attention, Relevance, Confidence, and Satisfaction) was employed to design 17 survey questions for evaluating Chinese students’ learning motivation. The questions include statements such as “the teaching method stimulates me to learn proactively,” “I can always focus on the learning activities,” “the learning activities are helpful for me,” and “I have confidence in finishing all learning activities.” The 5-point Likert scale was used to assess the level of learning motivation on a scale of 1 to 5 points. In terms of the reliability analysis, the Cronbach’s α is .937. As for CFA, the factor loadings lie between .557 and .777, with a CR of .938, and an AVE of .473. In the goodness of fit test of the scale, measures of absolute fit: χ²/df = 749.567, RMSEA = .122, GFI = .770, AGFI = .705, SRMR = .069; Incremental fit measures: CFI = .823, IFI = .824, NFI = .798; and parsimonious fit measures: PNFI = .698, PGFI = .599, although some indicators do not reach the strict standard, they are still acceptable.

Results

Common Method Variance

A potential issue regarding this survey is data bias. Researchers collect data from the same population by means of a single self-report inventory questionnaire. The data includes both dependent and independent variables within the conceptual framework. As a result, data biases are caused by common method variance (CMV) (Avolio, Yammarion & Bass, 1991). Thus, Harman’s single-factor test, which was suggested by Andersson & Bateman (1997) and was adopted to detect the CMV, was incorporated into the study (Podsakoff et al., 2003). All of the questions in the questionnaire will be analyzed by exploratory factor analysis (EFA), and if there is only one factor or a certain single factor responsible for most of the total variance (>50%), it indicates that significant common method bias exists.

There were a total of six factors extracted by exploratory factor analysis. The first factor accounted for 39.947 percent of the variance, which is less than 50 percent. The result suggested that common method bias was insignificant in this study.

Descriptive Statistics of Measurements
The descriptive statistics of all measurements is listed in Table 1. For interpersonal relationship, the mean of the 7 items ranged from 3.399 to 3.804, which indicated that the high school students had high interpersonal relationship, and for skewness and kurtosis, all indicators showed a normal distribution. For skewness and kurtosis, all indicators showed a normal distribution. For self-efficacy, the mean of the ten items ranged from 3.142 to 3.908, indicating high self-efficacy, and for skewness and kurtosis, all indicators showed a normal distribution. For learning motivation, the mean of 17 items ranged from 3.38 to 3.791, which indicated the high school students’ learning motivation was above average.

Table 1

<table>
<thead>
<tr>
<th>Measurement Items</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>3.804</td>
<td>.768</td>
<td>-.436</td>
<td>.82</td>
</tr>
<tr>
<td>A2</td>
<td>3.665</td>
<td>.799</td>
<td>-.351</td>
<td>.423</td>
</tr>
<tr>
<td>A3</td>
<td>3.67</td>
<td>.776</td>
<td>-.184</td>
<td>.249</td>
</tr>
<tr>
<td>A4</td>
<td>3.698</td>
<td>.802</td>
<td>-.287</td>
<td>.357</td>
</tr>
<tr>
<td>A5</td>
<td>3.729</td>
<td>.750</td>
<td>-.232</td>
<td>.462</td>
</tr>
<tr>
<td>A6</td>
<td>3.573</td>
<td>.802</td>
<td>-.091</td>
<td>.218</td>
</tr>
<tr>
<td>A7</td>
<td>3.399</td>
<td>.914</td>
<td>-.121</td>
<td>-.01</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.634</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>3.858</td>
<td>.843</td>
<td>-1.051</td>
<td>2.087</td>
</tr>
<tr>
<td>B2</td>
<td>3.413</td>
<td>.772</td>
<td>-.607</td>
<td>1.25</td>
</tr>
<tr>
<td>B3</td>
<td>3.802</td>
<td>.708</td>
<td>-.363</td>
<td>.716</td>
</tr>
<tr>
<td>B4</td>
<td>3.603</td>
<td>.737</td>
<td>.02</td>
<td>-.095</td>
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<tr>
<td>B5</td>
<td>3.422</td>
<td>.836</td>
<td>-.171</td>
<td>.054</td>
</tr>
<tr>
<td>B6</td>
<td>3.908</td>
<td>.760</td>
<td>-.5</td>
<td>.585</td>
</tr>
<tr>
<td>B7</td>
<td>3.737</td>
<td>.705</td>
<td>-.015</td>
<td>-.335</td>
</tr>
<tr>
<td>B8</td>
<td>3.617</td>
<td>.731</td>
<td>.129</td>
<td>-.154</td>
</tr>
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<td>B9</td>
<td>3.615</td>
<td>.727</td>
<td>.035</td>
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<tr>
<td>B10</td>
<td>3.142</td>
<td>.846</td>
<td>.031</td>
<td>.038</td>
</tr>
<tr>
<td>Learning motivation</td>
<td>3.551</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>3.416</td>
<td>.769</td>
<td>-.237</td>
<td>.095</td>
</tr>
<tr>
<td>C2</td>
<td>3.511</td>
<td>.751</td>
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<td>.329</td>
</tr>
<tr>
<td>C3</td>
<td>3.528</td>
<td>.784</td>
<td>-.216</td>
<td>.529</td>
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<td>C4</td>
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<td>C5</td>
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<td>.749</td>
<td>.094</td>
<td>.355</td>
</tr>
<tr>
<td>C6</td>
<td>3.598</td>
<td>.771</td>
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<td>.341</td>
</tr>
<tr>
<td>C7</td>
<td>3.508</td>
<td>.795</td>
<td>-.095</td>
<td>.251</td>
</tr>
<tr>
<td>C8</td>
<td>3.517</td>
<td>.762</td>
<td>-.038</td>
<td>.059</td>
</tr>
<tr>
<td>C9</td>
<td>3.707</td>
<td>.753</td>
<td>-.093</td>
<td>-.348</td>
</tr>
<tr>
<td>C10</td>
<td>3.791</td>
<td>.743</td>
<td>-.217</td>
<td>.013</td>
</tr>
<tr>
<td>C11</td>
<td>3.785</td>
<td>.760</td>
<td>-1.347</td>
<td>8.799</td>
</tr>
</tbody>
</table>
Discriminant Validity and Relevant Analysis

Table 2 presents the results of discriminant validity and correlation coefficients of the survey instrument. Our test results show that the square root of AVE greater than inter-construct correlations, which indicated good discriminant validity (Fornell and Lacker, 1981).

From the mean values, standard deviations, and correlation coefficients of all variables, shown in Table 2, it can be seen that the mean values of interpersonal relationship, self-efficacy, and learning motivation are 3.648, 3.612, and 3.551, respectively. The correlations of the variables land between .558 and .678, all reaching significance (p < .001). This indicates that correlations exist between the three variables, which may be further verified for their causal relation.

Table 2
The mean values, standard deviations, and correlation coefficients of all variables (N = 358)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Interpersonal relationship</th>
<th>Self-efficacy</th>
<th>Learning motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal relationship</td>
<td>.787</td>
<td>.558***</td>
<td>.678***</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td>632</td>
<td>.661***</td>
</tr>
<tr>
<td>Learning motivation</td>
<td></td>
<td>.688**</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.648</td>
<td>3.612</td>
<td>3.551</td>
</tr>
<tr>
<td>Standard deviations</td>
<td>622</td>
<td>.512</td>
<td>.544</td>
</tr>
</tbody>
</table>

Note: ***p < .001; a: Square root of AVE (average variance extracted)

Path Analysis of the Overall Model

Before the path analysis of the overall model related to the interpersonal relationship, self-efficacy, and learning motivation of high school students in Guangzhou was implemented, a goodness of fit test of the overall model was performed. The results are as follows. In terms of measures of absolute fit, \( \chi^2 = 1600.498 \), \( \chi^2/df = 3.049 \), which is close to the requirement of \( \chi^2/df < 3 \) (Ullman, 2001). RMSEA is .076. Although the value exceeds the strict standard of .05, it is acceptable as it is lower than .08 (McDonald & Ho, 2002). The results reveal that GFI was .762 and AGFI, .731, which fall short of the criteria of .90. However, Bollen (1990) proposes that when the sampling size is small, GFI and AGFI will be underestimated. SRMR was .060, which is close to the criteria of .05 (Hu & Bentler, 1999). As for incremental fit measures, the CFI was .839, IFI was .840, and NNFI was .779. For parsimonious fit measures, the PNFI and PGFI were .729 and .673 respectively, both exceeding the criteria of .50 (Mulaik, 2001). This indicates the overall model exhibited goodness of fit.

As shown in Table 3, the path coefficients of the students’ learning motivation related to interpersonal relationship and self-efficacy were .433 (p < .05) and .457 (p < .05) respectively, which indicates that the students’ interpersonal relationship and self-efficacy have significant positive effects on their learning motivation, and therefore H1 and H2 are valid. This demonstrates that good interpersonal relationship and higher self-efficacy of the high school students in Guangzhou promote their learning motivation, and this corresponds with the results of Anamand Stracke (2016). Second, the path coefficient of self-efficacy related to the students’ interpersonal relationship was .687 (p < .05), which indicates that the better the interpersonal relationship of a student, the higher the self-efficacy, and this corresponds with the research perspective of Arslan (2012) and Bandura (1997); therefore, H2 is valid.

Furthermore, the mediation model was tested. In this study, the bootstrapping method proposed by Shrout and Bolger (2002) was employed to test the accuracy of the estimated value of the mediation effect, through the procedure of resampling that obtains the mean value and the 95% confidence interval of the mediation effect. If the 95% confidence interval of the mediation effect does not include 0, it indicates that the mediation effect reaches the significance level of p < .05 (Shrout & Bolger, 2002).

The indirect effect of self-efficacy on interpersonal relationship and learning motivation was .314 (.687 * .457), while the confidence interval [.217, .407] did not include 0 and reached a significant effect (p < .05); this indicates that self-efficacy carries a mediation effect. The direct effect was .433, while the confidence interval [.307, .561] did not include 0, and the gross effect is .747 (.314 + .433), with a confidence interval [.674, .809]
that does not include 0. This means that the effect carries statistical significance, and simultaneously, self-efficacy renders a partial mediation effect between interpersonal relationship and learning motivation (Table 3 and Figure 2); therefore, H4 is valid. In other words, students’ interpersonal relationship has a positive effect on learning motivation, and can indirectly affect their learning motivation through self-efficacy. Therefore, the high school students of Guangzhou have good interpersonal relationship, which promotes their self-efficacy, and, in turn, increases their motivation of active participation in learning activities.

Table 3
Bootstrap SEM analysis of total, direct, and indirect effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Standardized estimate</th>
<th>p value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal relationship &lt;-&gt; Self-efficacy</td>
<td>0.687</td>
<td>&lt; 0.05</td>
<td>[.621, .744]</td>
</tr>
<tr>
<td>Interpersonal relationship &lt;-&gt; Learning motivation</td>
<td>0.433</td>
<td>&lt; 0.05</td>
<td>[.307, .561]</td>
</tr>
<tr>
<td>Self-efficacy &lt;-&gt; Learning motivation</td>
<td>0.457</td>
<td>&lt; 0.05</td>
<td>[.316, .589]</td>
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<td>Indirect effect</td>
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<tr>
<td>Interpersonal relationship &lt;-&gt; Learning motivation</td>
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<td>&lt; 0.05</td>
<td>[.217, .407]</td>
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<tr>
<td>Total effect</td>
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<td></td>
<td></td>
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<tr>
<td>Interpersonal relationship &lt;-&gt; Learning motivation</td>
<td>0.747</td>
<td>&lt; 0.05</td>
<td>[.674, .809]</td>
</tr>
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</table>
Discussion

The high school students of Guangzhou have experienced the closed-off management of the city during the height of the COVID-19 pandemic. With the epidemic subsiding, schools have gradually resumed classes. After such experience, whether the students’ psychological factors such as interpersonal relationship, self-efficacy, and learning motivation have changed and how these three factors interact with one another are the points of focus of this study. Through the literature review, and with SCT as the basis, this study explores the effect of students’ interpersonal relationship and self-efficacy on learning motivation, and the mediation effect rendered by students’ self-efficacy between interpersonal relationship and learning motivation.

From the results of this study, the interpersonal relationship of the high school students of Guangzhou has a positive effect on self-efficacy and learning motivation. This indicates that when the students have good relationship with their peers and teachers, they exhibit stronger confidence and belief in their own learning behaviors, and show eagerness to participate in activities related to learning. The reason for this may be that the time in high school is an important period for interpersonal relationship development, while interpersonal interaction is a crucial part of the self-development process of adolescents. Every adolescent needs interpersonal relationship (Bakke, 1992) as they become less dependent on parents and gradually turn to people of the same age for peer recognition (Wang et al., 2020). However, in the process of closed-off management, the students could only interact with their families, or connect with schoolmates, friends, and teachers via communication devices. After the classes resumed, face-to-face interactions and conversations with schoolmates, friends, and teachers have once again become possible, satisfying the needs of the students in interpersonal relationship.

The results show that the mean values of the students’ interpersonal relationships (3.648), self-efficacy (3.634) and learning motivation (3.551) were higher than the respective averages. This implies that the lack of face-to-face interactions between students and teachers will not lead to alienation in their interpersonal relationships. Furthermore, it suggests that students will promptly restore and develop their interpersonal relationships after returning to school and as such will rapidly return to effective learning. Therefore, the peer relationship and teacher–student relationship have become closer, while their influence on each other has expanded. After the students have experienced the interpersonal interactions at school, their feelings of self-worth in learning can be increased (Martin, 2009), thereby increasing their confidence in their expected learning outcomes and eagerness to participate in learning activities.

The self-efficacy of high school students in Guangzhou can induce their learning motivation, as well as their belief in learning development and self-perseverance (Pajares, 2008), while leading them to the judgment that they possess the capability to complete the course of learning (Zimmerman, 2000), and encouraging them to choose and participate in activities related to learning. The high school students of Guangzhou missed school for a long time due to the pandemic. After classes resumed, they have developed stronger belief in learning and confidence in satisfying the learning requirements; as a result, they have stronger motivation in participating in learning activities. Therefore, after the students have experienced the interpersonal interactions at school, their feelings of self-worth in learning can be increased (Martin & Dowson, 2009), thereby increasing their confidence in their expected learning outcomes and eagerness to participate in learning activities (Furrer & Skinner, 2003; Kuhet al., 2005; Wentzel, 2012).

The self-efficacy of the high school students in Guangzhou renders a positive mediation effect between interpersonal relationship and learning motivation. After the students return to school, they would actively interact with their schoolmates and teachers in interpersonal relationship and courses, and seek the recognition from schoolmates and teachers, as they provide important psychological support and protection for the students (Mellor et al., 2008). This mitigates the environmental and psychological stresses brought by COVID-19 and helps the students to develop positive values and attitudes (Gilmore & Meersand, 2013), as well as to believe in their own confidence and capabilities to complete and accept the challenges in learning (Bandura, 1986). Therefore, students will actively build their interpersonal relationships so as to facilitate their self-efficacy and further enhance their learning motivation after their person courses resume.

Conclusions

This study has shown that interpersonal relationship, self-efficacy, and learning activities of high school students in Guangzhou under the impact of COVID-19 are correlated. The result indicates that better interpersonal relationship can enhance self-efficacy and learning motivation; furthermore, when students have high self-efficacy, they demonstrate high learning motivation. When students have good interpersonal relationship, their self-efficacy is promoted, which in turn increases their motivation in participating in learning.

Under the impact of the Covid-19 pandemic, the high school students of Guangzhou experienced the closed-off management. Nonetheless, it took the students a while to return to their campus, but they did not feel a sense of alienation among their schoolmates and teachers. On the contrary, the students positively interacted with their classmates and teachers and rapidly established interpersonal relationships, which increased their confidence in learning. After gaining self-confidence in learning, they then became more motivated to actively participate in activities related to their studies.
From the research results and discussion, two important findings are drawn. First, after experiencing the closed-off management under COVID-19, the high school students have stronger needs to satisfy their interpersonal relationship, and as a result, they proactively engage in interactions with schoolmates and teachers since classes resumed. Second, given the pandemic, the students could not attend schools. This has brought about stronger belief in learning as they rejoined schools. These two parts deserve our attention with the impact of COVID-19. Therefore, it has been recommended that after reopening, schools should hold activities to encourage better peer and teacher–student interactions for closer relationship. Finally, activities related to learning may be arranged to increase teacher–student interactions in courses, promote the confidence of students in learning, and enable them to obtain higher self-efficacy.

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References


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**Author Information**

**Yuan-Cheng Chang**

Department of Education Management, China-Asean International College, Dhurakij Pundit University, Thailand