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Citation

The relationship between future goals and achievement goal orientations: An intrinsic–extrinsic motivation perspective

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ABSTRACT

This research aimed to study the relationships between students' future goals (FGs) and their immediate achievement goal orientations (AGOs) among 5733 Singaporean secondary school students (*M* age = 14.18, *SD* = 1.26; 53% boys). To this end, we hypothesized that the relationships between like valenced FGs and AGOs (both intrinsic or both extrinsic) will be stronger than those of opposite valenced FGs and AGOs (intrinsic–extrinsic) and tested two alternative models: Model A positing the prediction of AGOs by FGs and Model B positing the prediction of FGs by AGOs. Structural equation modeling showed the heuristic superiority of Model B in which intrinsic FGs (career-, society-, and family-oriented) were more strongly related to mastery-approach goal orientation than to performance-approach goal orientation and extrinsic FGs (fame- and wealth-oriented) were more strongly related to performance-approach goal orientation than to mastery-approach goal orientation. The findings suggest that, to enhance school motivation, teachers should encourage students to adopt intrinsic AGOs and FGs.

1. Introduction

Getting students involved, engaged, and motivated in learning activities is perhaps one of the most challenging tasks that parents and teachers have to deal with. Motivation is an internal state that instigates, directs, and maintains behavior. Intrinsic and extrinsic motivation lie as bedrock constructs underpinning a number of contemporary theories of motivation such as attribution theory (Weiner, 1985), expectancy-value theory (e.g., Feather, 1988; Wigfield & Eccles, 1992; Wigfield, Tonks, & Eccles, 2004), self-determination theory (Deci & Ryan, 2000a, 2000b), self-efficacy theory (Zimmerman, 2000) as well as achievement goal theory (Elliot, 1999; Meece, Anderman, & Anderman, 2006) and Future Time Perspective (FTP) (DeVolder & Lens, 1982; Simons, Vansteenkiste, & Lens, 2004) (see also Schunk, Pintrich, & Meece, 2008 for a comprehensive review).

The rationale behind the present study is to examine potential synergies that may exist between forms of achievement goals drawn from goal theory and types of future goals drawn from FTP when situated within an intrinsic–extrinsic perspective. The

theoretical and empirical literature dealing with achievement goal orientations (such as mastery and performance goals; Elliot, 1999, 2005; Meece et al., 2006) and that dealing with future goals (such as desiring a good career; DeVolder & Lens, 1982; McInerney, 2004; Nurmi, 1991) have proceeded in parallel with little crossover of ideas. However, it would appear plausible that particular achievement goal orientations may align with particular future goals in such a manner as to maximize positive behavioral outcomes. As such, a study that examines the links between the two constructs not only offers theoretical contributions to the achievement motivation literature, but also holds important practical implications for teachers optimizing student academic engagement by emphasizing both adaptive achievement goals and future goals.

Using an intrinsic and extrinsic motivation perspective the present study investigated the links between achievement goal orientations and future goals among 5773 Singaporean secondary school students. As elaborated below, we categorized future goals and achievement goal orientations as intrinsic or extrinsic and addressed the following research questions: Do different future goals have differential relationships with achievement goal orientations? Specifically, are intrinsic future goals related more strongly to an intrinsic achievement goal orientation than to an extrinsic achievement goal orientation? Conversely, are extrinsic future goals more strongly associated with an extrinsic achievement goal orientation than with an intrinsic achievement goal orientation?

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2. Intrinsic and extrinsic motivation

Intrinsic motivation, generally referred to as the motive that keeps individuals at a task through its own inherent qualities (Ryan & Deci, 2000), is a complex concept with many interpretations of what constitutes it and what its underlying processes are (Heckhausen, 1991). Elements of intrinsic motivation include enthusiastic task involvement, desire to experience adventure and novelty, striving for excellence in one's work, trying to understand something and wishing to improve, and goal direction (that is, seeing a purpose in what one is doing) (see Fredricks, Blumenfeld, & Paris, 2004; McInerney & McInerney, 2010; Reeve, Deci, & Ryan, 2004). Students who are intrinsically motivated – that is who think a task is useful, interesting and important – are more likely to persist with it and be more willing to try different strategies to achieve their goals (Pokay & Blumenfeld, 1990; Vansteenkiste, Lens, & Deci, 2006).

Extrinsic motivation is generally referred to as the motive that keeps individuals at a task by the application of external rewards (Ryan & Deci, 2000). Elements of extrinsic motivation include concern for rewards, sanctions, praise, feedback, and grades (Deci & Ryan, 2000a, 2000b; Vansteenkiste et al., 2006). Students who are extrinsically motivated – that is who do a task for the purpose of rewards and other external prompts – are more likely to engage in surface learning and less likely to persist with the activity once extrinsic rewards and prompts are removed (Biggs, 1991). Furthermore, extrinsic motivation is generally thought to indicate to students how well they have performed individually in comparison to others, irrespective of task interest. As such, success in an extrinsically motivated activity states something about the competence of the student and may act as an effective motivator for further task involvement provided the student is successful. However, for students who do not receive 'payback' such an extrinsic system can lead to a reduction in their sense of competence and a subsequent loss of interest in the task (Merrett & Tang, 1994; Miller, Ferguson, & Simpson, 1998).

There is an extensive literature debating the nature and the relative merits of intrinsic versus extrinsic motivation. Recent reviews (Boggiano & Barrett, 1992; Kohn, 1996; Lepper, Corpus, & Iyengar, 2005; Ryan, Connell, & Deci, 1985) re-emphasize the key findings of the earlier research. These reviews widen their analyses to include the effects of external evaluation and performance feedback, social control, task design and task structure on the student's *continuing motivation* for the task, problem-solving ability and creativity. They conclude that extrinsic motivation may have a negative effect on continuing motivation.

Counter views are expressed by a number of authors who believe that extrinsic motivation can be used to enhance intrinsic motivation (Cameron & Pierce, 1994, 1996). When tangible rewards, such as gold stars or money, are offered contingent on performance of a task, or are delivered unexpectedly, intrinsic motivation may be maintained. Rewards can be offered for work completed, for solving problems successfully, or for maintaining a predetermined level of performance without undermining intrinsic motivation (see also Deci, Koestner, & Ryan, 2001; Kohn, 1996; Lepper, Keavney, & Drake, 1996; Ryan & Deci, 1996).

Intrinsic and extrinsic motivation may be dichotomized as two goals rather than as opposing dimensions of a single motivation construct continuum (Lepper, Henderlong, Carol, & Judith, 2000; see also Rawsthorne & Elliot, 1999; Sansone & Harackiewicz, 2000 for elaborated discussions). Indeed, recent research indicates that both intrinsic and extrinsic motivation can coexist, be experienced simultaneously, and adopted at a similar level. This is consistent with prior research demonstrating a positive moderate correlation between the approach dimension of performance and mastery goal orientations, especially among Asian students (see Ho, Hau, & Salili, 2007; Liem, Lau, & Nie, 2008; Liem & Nie, 2008; Liem & Prasetya, 2006; Salili & Lai, 2003).

3. Achievement goal theory and intrinsic/extrinsic motivation

For purposes of the present research we focus on achievement goal theory which has emerged as an important theory because of its valuable insights into the field of motivation over the past three decades (Meece et al., 2006; Schunk et al., 2008) and which appears to clearly articulate intrinsic and extrinsic dimensions which we explore later in the paper. Achievement goal theory posits that there is an integrated pattern of beliefs (goal orientations) that lead students to approach, engage, and respond to achievement tasks and situations in specific ways (Schunk et al., 2008). Goals represent the purposes that students have in different achievement situations, and are presumed to guide students' behavior, cognition and affect as they become involved in academic work (Ames, 1992; Anderman, Austin, & Johnson, 2002; Covington, 2000; Elliot, 2005; Kaplan & Maehr, 2007). Two academic goals have been the focus of much research: mastery goals (sometimes called learning goals or task goals) and performance goals (sometimes called ego goals or relative ability goals).

Central to a mastery goal is the belief that effort leads to success: the focus of attention is the *intrinsic value of learning*. With a mastery goal, individuals are oriented towards developing new skills, trying to understand their work, improving their level of competence or achieving a sense of mastery (Elliot, 1999, 2005; Pintrich, Conley, & Kempler, 2003). In other words, students feel successful if they believe they have personally improved or have come to understand something. Their performance relative to others is irrelevant; of greater importance to them is the task. The latest development of achievement goal theory has bifurcated mastery goal orientation into two forms, mastery-approach and mastery-avoidance (Cury, Elliot, Da Fonseca, & Moller, 2006; Elliot, 1999; Elliot & McGregor, 2001; Pintrich et al., 2003). While a mastery-approach goal orientation is essentially identical to the mastery goal orientation explained above, a mastery-avoidance goal focuses on avoiding showing misunderstanding or avoiding not learning or not mastering the task (Elliot, 1999, 2005; Pintrich et al., 2003).

Central to a performance goal is a *focus on one's ability and sense of self-worth*. Ability is shown by doing better than others, by surpassing norms or by achieving success with little effort. Public recognition for doing better than others is an important element of a performance goal orientation. Performance goals and achievement are 'referenced' against the performance of others or against external standards such as marks and grades. Consequently, 'self-worth' is determined by one's perception of ability to perform relative to others. Hence, when students try hard without being completely successful (in terms of the established norms), their sense of self-worth may be threatened (Ames, 1992; Covington, 1992, 2000; Dweck & Leggett, 1988; Nicholls, 1989). Performance goals have also been bifurcated into performance-approach and performance-avoidance goals (Elliot, 1999, 2005; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002a; McGregor & Elliot, 2002; Middleton & Midgley, 1997; Skaalvik, 1997; Smith, Duda, Allen, & Hall, 2002; Urdan, 1997; Wolters, 2004). Students who hold a performance-approach goal orientation want to do better than their classmates so that they will be recognized as competent by their peers, teachers and parents. Students who hold a performance-avoidance goal orientation do their academic work primarily because they fear appearing incompetent (Elliot, 1999).

3.1. Adaptive and maladaptive achievement goals

Research suggests that mastery-approach is an adaptive motivator. Students adopting a mastery-approach goal orientation tend to use high levels of deep cognitive strategies, such as elaboration, as well as metacognitive and self-regulatory strategies (Covington, 2000; Elliot, 2005; Elliot, McGregor, & Gable, 1999; Fuchs et al., 1997; Gabriele, 2007; Harackiewicz, Barron, Tauer, & Elliot, 2002b; Harackiewicz et al., 2002a; Liem et al., 2008; Nolen, 1988; Obach, 2003; Pugh & Bergin, 2006; Wolters, 2004). A similar pattern of findings has been found across cultures (Watkins, McInerney, Akande, & Lee, 2003; Watkins, McInerney, Lee, Akande, & Regmi, 2002). The few studies that have examined a mastery-avoidance goal orientation have demonstrated that this orientation is mostly unrelated to cognitive strategies, but negatively related to intrinsic motivation, perceived competence (Cury et al., 2006) and classroom grades (Liem & Prasetya, 2006), and positively related to negative emotions such as test anxiety and worry, (Elliot & McGregor, 2001), help-seeking threat (Karabenick, 2003), and to less adaptive approaches to learning (Cury et al., 2006).

Research has also demonstrated the adaptive effects of a performance-approach goal orientation on valued educational outcomes such as deep cognitive strategies, positive affects, positive peer relationships, and classroom grades (see e.g., Liem et al., 2008; Pekrun, Elliot, & Maier, 2009; see also Kaplan & Maehr, 2007 for a review). It should be noted, however, that a performance-approach goal orientation has also been associated with negative outcomes such as anxiety, disruptive behavior, and low retention of knowledge (Midgley, Kaplan, & Middleton, 2001). In contrast, students who adopt a performance-avoidance goal orientation are more likely to use surface cognitive strategies such as rote memorization and rehearsal (Liem et al., 2008; Pugh & Bergin, 2006; Watkins et al., 2002, 2003). Furthermore, a performance-avoidance goal orientation also appears to diminish intrinsic motivation for learning (Rawsthorne & Elliot, 1999) and is related to low levels of task engagement and persistence, avoidance of help-seeking, anxiety, procrastination, and low grades (Elliot, 1999, 2005, 1999; Harackiewicz et al., 2002a, 2002b; Kaplan, Gheen, & Midgley, 2002; Pintrich, 2000; Sideridis, 2005; Urdan, 2004; Wolters, 2003).

Throughout the literature there appears to be a clear connection between mastery goals and intrinsic motivation and performance goals and extrinsic motivation (Lepper et al., 2000; Rawsthorne & Elliot, 1999). This study utilizes this connection to study the relationship between achievement goal orientations and future goals described in the next section.

4. The role of the Future Time Perspective in academic motivation

A critical component of this research is our focus on personally valued future goals that students may hold. The formation of future goals has been examined in career development theories (Mitchell & Krumboltz, 1996; Super, 1990) and through empirical research (see Austin & Vancouver, 1996). Future goals may reflect such things as pursuing an education, work or career-related pursuits, and establishing a family (Nurmi, 1991). Perceptions of possible future goals emerge as individuals develop interests in academic and social learning activities in which they feel competent and which result in valued outcomes such as recognition, money, status, autonomy, or group allegiance. From this perspective, achievement goal orientations may influence the future goals students develop.

Future goals have been extensively studied within a Future Time Perspective theoretical framework. Future Time Perspective (FTP) has been conceptualized as the present anticipation of future goals (DeVolder & Lens, 1982; Simons et al., 2004). By understanding motivation in the context of FTP, researchers have focused on how future goals may enhance students' engagement, level of information processing, persistence, and academic performance. Studies have shown that students with a clearer and more extended FTP are more motivated in their current tasks (DeVolder & Lens, 1982; McInerney, 2004). Miller and Brickman (2004) proposed that future goals guide the development of short-term goals and help establish the link between present and future. Therefore, future goals make participation and engagement in current tasks more meaningful. Students who are able to plan and track their progress towards their future goals are more motivated and persistent in learning compared to those who do not see the link between the present and the future (Simons et al., 2004). In line with this, Horstmanshof and Zimitat (2007) recommended that teachers should focus on the development of students' FTP in order to encourage and support students' academic engagement. Bembenutty and Karabenick (2004) also emphasized the role of future goals in reducing students' need to seek immediate gratification, which consequently enhances the likelihood of completing academic tasks. From this perspective, future goals may influence the achievement goal orientation of students.

While the cognitive aspect of FTP has been extensively studied, there has been little attention paid to the motivational role of the dynamic aspect of FTP (Simons et al., 2004). Three aspects of future goals are typically discussed in the literature: the instrumentality of current tasks in attaining future goals, the internal or external regulation of behavior by future goals, and the content of future goals (see Bembenutty & Karabenick, 2004; Horstmanshof & Zimitat, 2007; Nurmi, 1991, 2005). In other words, the positive impact of future goals can depend on whether students perceive a task as relevant to their future goals, whether the future goals are self-set or imposed by authority, and what students aspire towards in the future. Of these three aspects, the latter, future goal content has received less attention in research.

In this study, and in line with our definition of goal orientations, we define the content of future goals as a cognitive representation of what it is that a student seeks to achieve in his or her future. Around the age of 11 or 12, children generally begin to develop the ability to construct concepts of a more distant future (Nurmi, 2005). Typically, adolescents regard future occupation, education, leisure activities, future family, contribution to society, and material wealth as important future concerns (Nurmi, 1991, 2005). Further, when asked about their fears and worries about their future, many of them report concerns such as unemployment, school failure, or an unhappy marriage. Gillies (1989) found a somewhat similar pattern in her longitudinal study investigating adolescents' hopes and worries. She found that career, healthy family, and money were adolescents' prominent concerns. These future concerns, hopes, and worries are well reflected and represented in various measures designed to tap individuals' future aspirations or goals. For example, Kasser and Ryan's (1993, 1996) Aspirations Index (AI) includes wealth, fame, image, personal growth, relationship, and community in assessing individuals' future aspirations. Wilding and Andrews's (2006) Life Goals Questionnaire measures five categories of future goals, namely career, family, financial security, attainment of prominent position in the society, and contribution to the well-being of other people. Importantly, there appears to be little variation across societies and cultures in such hopes and interests for the future (Nurmi, 1991).

On the basis of the variety of substantively distinct future goals identified among adolescents in different cultures (e.g., Gillies, 1989; Nurmi, 1991, 2005) including in Singapore (McInerney, Liem, Ortiga, Lee, & Manzano, 2008), in the present study we investigated five future goals salient to adolescents. These future goals include:

(a) fame-oriented future goal which concerns the importance of becoming a famous or well-known person in the future; (b) wealth-oriented future goal which concerns the importance of having money and other material possessions in the future; (c) career-oriented future goal which concerns the importance of having a good job or career in the future; (d) society-oriented future goal which concerns the importance of contributing to or making an impact on society in the future; and (e) family-oriented future goal which concerns the importance of providing support to one's future family.

4.1. Future goals and intrinsic/extrinsic motivation

In this research we distinguish intrinsic future goals from extrinsic future goals. Categorizing future goals into either intrinsic or extrinsic is not entirely new. A number of researchers have considered goals as either intrinsic or extrinsic. For example, conducting a cross-cultural study in 15 countries (e.g. Australia, Canada, China, Egypt, India, Romania, South Korea, Spain, and United States), Grouzet et al. (2005) differentiated individuals' goal contents into either intrinsic or extrinsic. Despite a few small cross-cultural variations, the distinction of future goals into intrinsic or extrinsic categories was essentially the same: self-acceptance, affiliation, community feeling, and physical health were intrinsic, whereas financial success, image, and recognition for past work were extrinsic. Differentiating future goals based on whether their contents are intrinsic or extrinsic has also been advocated outside the field of future goal research. Noddings (2006), a moral development theorist, differentiates goals according to those that allow students to develop themselves and those that simply encourage students to achieve some normative standards (e.g. higher grade point average). Noddings believes that wealth- and status-oriented goals are related to different learning outcomes from goals that pertain to finding one's passion.

Following this line of argument, and for purposes of this study, intrinsic future goals are defined as those that focus on one's personal growth, are oriented towards improving oneself and concern for welfare of others, rather than oriented towards achieving material aspects of life. In contrast, extrinsic future goals are defined as goals that focus on achieving material possessions such as money, image, prestige, or status. Based on these definitions, we classified societal, family and career focused goals as intrinsic future goals, and fame and wealth focused goals as extrinsic future goals.

5. Relationships between future goals and achievement goal orientations

With respect to the content of future goals (e.g., to achieve a good career, to become a well-known person in society, or to contribute to society) research has focused on the differential effects of future goals on students' psychological well-being, approaches to learning, engagement, and academic performance. These studies demonstrate that students who prioritize financial success more than other goals (such as contributing to society or having an outstanding career) tend to score lower on mental well-being. Students who place high importance on money, image and popularity also report less self-actualization and happiness (Kasser & Ahuvia, 2002). On the other hand, students who place higher importance on helping the community or developing one's career are more likely to be psychologically well adjusted (Kasser & Ryan, 1993; Sheldon, Ryan, Deci, & Kasser, 2004).

Experimental studies have also shown that when intrinsic future goals (e.g., to contribute to society or to conserve the environment) are emphasized, students are likely to endorse deep information processing, have better academic performance, and become more persistent than when extrinsic future goals (e.g., to make a lot of money) are emphasized (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). In a longitudinal study on undergraduate students, Wilding and Andrews (2006) found a consistent relationship between students' general life goals and their approach to study. Altruistic life goals were associated with a deep learning approach while wealth and status life goals were associated with a surface learning approach. A decrease in the deep learning approach over the years was significantly related to a decrease in altruistic life goals. Endorsement of wealth and status life goals was significantly related to higher use of surface approach to learning. Based on these studies, it seems that intrinsic future goals (e.g., to help the community) are associated with a learning approach that is based on intrinsic motivation (i.e., deep approach). Conversely, extrinsic future goals (e.g. to gain a high status) appear to be related to a learning approach that is based on extrinsic motivation (i.e., surface learning). The above findings provide not only empirical support to the classification of future goals into extrinsic and intrinsic made in the present study but also an empirical basis for hypothesizing relationships between future goals and achievement goal orientations. Because mastery goal orientation is inherently underpinned by intrinsic motivation and performance goal orientation is inherently underpinned by extrinsic motivation (see Lepper et al., 2000; Rawsthorne & Elliot, 1999), we predicted that future goals and achievement goal orientations of the same valence (e.g. intrinsic–intrinsic or extrinsic–extrinsic) should be positively and more strongly related to each other than those of opposite valence (e.g. intrinsic–extrinsic or extrinsic–intrinsic). More specifically, fame-oriented and wealth-oriented future goals should be positively and more strongly associated with a performance goal orientation than a mastery goal orientation. In contrast, career-oriented, society-oriented, and family-oriented future goals should be positively and more strongly associated with a mastery goal orientation than a performance goal orientation.

These predictions are supported by Nicholls, Patashnick, and Nolen (1985) who demonstrated that students' perceptions that attaining wealth and power were the primary purposes of education were positively correlated with their adoption of a performance goal orientation. In contrast, students' adoption of a mastery goal orientation was not related to these perceptions. The Nicholls et al. study provided early evidence showing the link between students' future-related beliefs and their achievement goal orientations. Further, in other studies, the congruence in the inherent characteristics of one's distal and proximal goals was found to produce optimal positive effects on one's self-regulatory activity (Kozlowski & Bell, 2006) and heightened enjoyment of doing the task (Durik & Harackiewicz, 2003).

In a related context research on intrinsic versus extrinsic goal framing suggests that when teachers provide students with a rationale for a learning task/activity that will help students understand the value of the learning for themselves, it is important that the teachers focus on intrinsic goals (e.g., personal growth, meaningful relationships with others, becoming more healthy and fit) rather than extrinsic goals (e.g., fame, financial success, physical appearance). This suggests if teachers help students see the long-term relevance of the learning activity in terms of intrinsic goals, the students become more engaged with the learning and in turn to understand the materials more fully and to perform better in demonstrating their competence. Studies also show that, regardless of whether students are extrinsically or intrinsically motivated, they benefit from having teachers emphasize the intrinsic goal utility of the learning activities (see Vansteenkiste et al., 2006).

5.1. Directions of prediction

The present study was also concerned with examining the relationships in terms of directions of effects. As indicated earlier in

the paper it is possible that students who are mastery oriented (that is intrinsically motivated) may hold future goals that are more intrinsic in nature. Conversely, students who are highly performance oriented (that is extrinsically motivated) may hold future goals that are more extrinsic in nature. The alternative possibility discussed earlier in the paper is that the future goals students hold, whether intrinsic or extrinsic, may influence the nature of their achievement motivation to be more mastery or performance oriented. Whilst some theorists posited that people plan their life by working backward in time from the future to the present (e.g. Miller & Brickman, 2004; Tabachnick, Miller, & Relyea, 2008), Markus and Ruvolo (1989) proposed that people may plan their life by setting goals for their current states and then moving onto sketching their future accordingly. Integrating the two stances, however, Karniol and Ross (1996) maintained that people may in fact work both ways – planning forward or backward, depending on their contextual factors. Hence, in the present study we tested alternative models delineating the prediction of future goals by achievement goal orientations and vice versa. By doing so we may provide some tentative evidence as to the direction of influence.

5.2. Dichotomous or continuous variables

An examination of the relationships between future goals and achievement goals from an intrinsic–extrinsic perspective introduces the thorny issue of whether intrinsic and extrinsic motivation are dichotomous or continuous. Self-determination theory researchers (e.g., Ryan & Deci, 2000), for example, view extrinsic and intrinsic motivators lying on a continuum of a single motivational force. Alternatively, intrinsic and extrinsic motivation may be dichotomized as two goals (Lepper et al., 2000; Rawsthorne & Elliot, 1999). This is not an easy theoretical issue to resolve. For purposes of the present research we consider mastery goal orientation (i.e., intrinsic motivation) and performance goal orientation (i.e., extrinsic motivation) as two dichotomous and independent constructs rather than as opposite dimensions of a continuum of a single achievement goal construct. This treatment implies that the two achievement goal orientations may coexist and be adopted simultaneously and at a similar level (Lepper et al., 2000). This is consistent with prior research with Singaporean students (e.g., Liem et al., 2008) – who constituted the sample of the present study – demonstrating a positive correlation between the mastery-approach and performance-approach goal orientations. While it may be difficult to clearly and orthogonally describe intrinsic motivation in contrast to extrinsic motivation, ultimately this might not make a difference but to say that it is a matter of what is the predominant forces at play in providing motive for action.

6. The present study

The study of achievement goals and future goals has taken place in relative isolation and this research aims to address this lack of conceptual and empirical integration. Specifically, we aimed to contribute to the literature by investigating the relationship between students' future goals and their achievement goal orientations. The following research questions were addressed: Do different future goals have differential relationships with achievement goal orientations? Are intrinsic future goals (i.e., career-oriented, society-oriented, and family-oriented future goals) related more strongly to an intrinsic goal orientation (i.e., a mastery goal orientation) than to an extrinsic goal orientation (i.e., a performance goal orientation)? Conversely, are extrinsic future goals (i.e., fame-oriented and wealth-oriented future goals) more strongly associated with a performance goal orientation than a

mastery goal orientation? Based on our review of relevant past empirical findings (e.g., Kozlowski & Bell, 2006; Nicholls et al., 1985), we hypothesized that future goals and achievement goal orientations of the same valence (e.g. intrinsic–intrinsic or extrinsic–extrinsic) should be positively and more strongly related to each other than those of opposite valence (e.g. intrinsic–extrinsic or extrinsic–intrinsic).
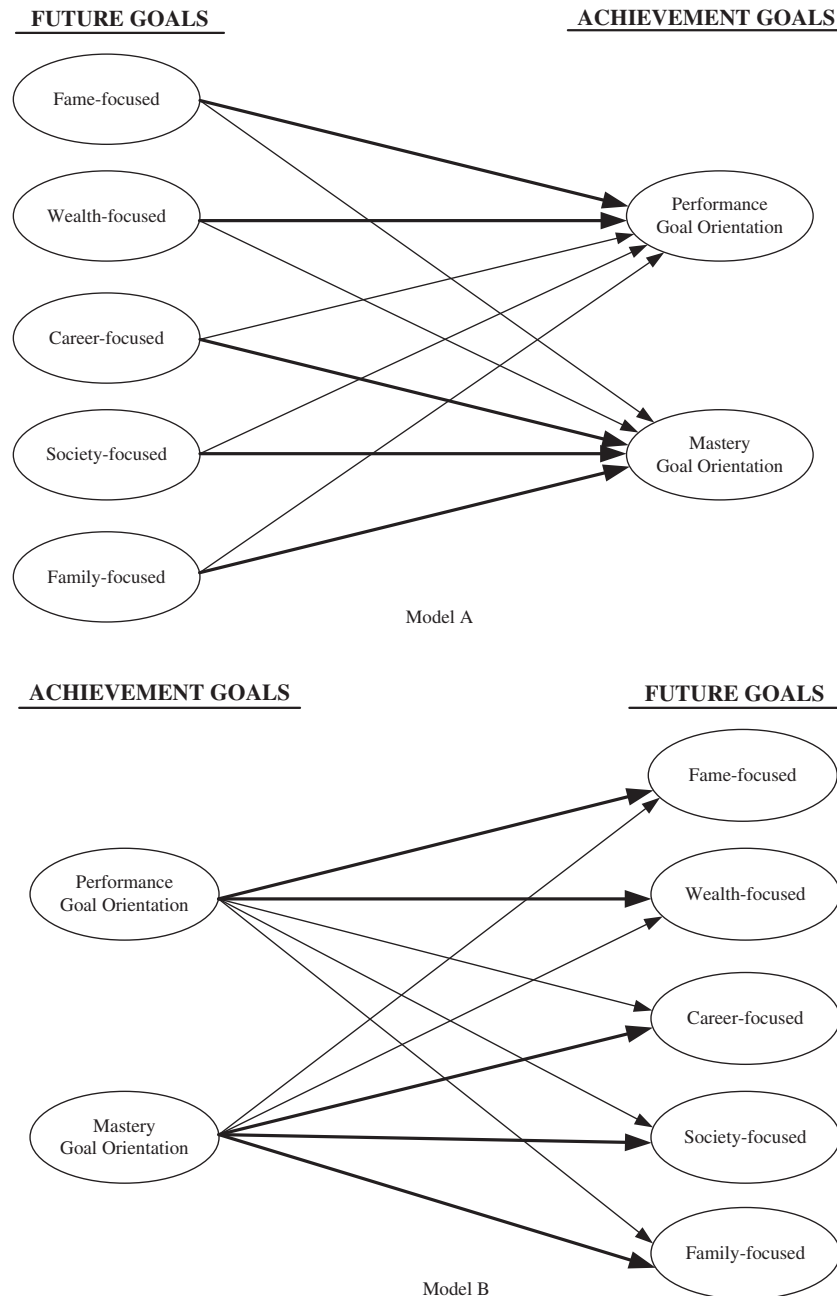
We also wished to examine the relative predictive influence of achievement goals and future goals on each other. We used structural equation modeling (SEM) to test the relationships between future goals and achievement goal orientations. To this end, we compared two competing models (Models A and B) delineating the possible relationships between future goals and achievement goal orientations. As shown in Fig. 1, Model A delineates the prediction of achievement goal orientations by future goals, and Model B delineates the prediction of future goals by achievement goal orientations. Hence, our analysis is consistent with the methodological recommendation by MacCallum, Wegener, Uchino, and Fabrigar (1993, p. 185) that researchers should test alternative equivalent models because "for any given model, there will generally be alternative models, represented by different patterns of relations among the variables... (which) can be distinguished only in terms of the interpretability of parameter estimates and meaningfulness of the model" (see also MacCallum, Roznowski, & Necowitz, 1992). It is important to note that, in this study, we focus on the approach-oriented achievement goals, rather than their avoidance-oriented counterparts, to align them with the future goal construct which is also conceptually underpinned by the approach motivational orientation. In other words, both achievement goals and future goals examined in this study are underpinned by the approach valence of achievement motivation (i.e., focusing on attaining a positive, desirable possibility) rather than the avoidance valence (i.e., focusing on avoiding a negative, undesirable possibility) (see Elliot & Trash, 2001).

7. Method

7.1. Participants

The analyses conducted in the present study were based on the data from a large-scale investigation titled, "Building the Future for Singaporean Students", conducted in 2007–2008. The broad aim of the project was to investigate how Singaporean students' values and motivations relate to their learning and academic performance. To this end, a questionnaire was administered to 5773 students: 33.4% Secondary-1 (Year-7), 27.3% Secondary-2 (Year-8), 27.9% Secondary-3 (Year-9), 9.8% Secondary-4 (Year-10), and 1.6% Secondary-5 (Year-11) students drawn from 13 secondary schools of mixed ability across the island city. The sampling of the schools was carried out in a way that ensured the representativeness of schools in each of Singapore's educational jurisdictions (North, South, West, and East). The mean age of the participants was 14.18 years (SD = 1.26). The sample comprised 53% boys.

In terms of ethnicity, the sample comprised 69.6% Chinese, 20.1% Malay, and 3.8% Indian, whereas the remaining 6.5% were categorized under "others". Although English, Mandarin Chinese, Malay, and Tamil are the four official languages spoken in Singapore, English is the main working language and used as the medium of instruction in schools. Given the nations' multilingualism, it is not surprising that a variety of languages were spoken by our participants at home, and these included English (28.7%), Mandarin Chinese (42.4%), Malay (14.7%), Tamil (1.4%), and English mixed with another language (12.8%). The participants' socioeconomic status (SES) is inferred from the information obtained about their parents. The sample's fathers' and mothers' highest levels of

Fig. 1. Hypothesized models delineating the prediction of achievement goal orientations by future goals (Model A) and the prediction of future goals by achievement goal orientation (Model B). Note: bolded lines represent the relationships between constructs with the same valence (both intrinsic or both extrinsic), whereas non-bolded lines represent the relationships between constructs with opposite valences (intrinsic and extrinsic or vice versa).

education spanned from primary to tertiary education, with the majority of them completed secondary education, and these parents were of a wide and diverse range of occupations (e.g., factory worker, taxi driver, doctor, lawyer). Given the school sampling procedure, the sample size, and the range of sample characteristics (i.e., cultural groups, languages spoken at home, and SES), our sample can be claimed to be broadly representative of Singaporean secondary school students.

7.1.1. Cross-validation

For the purpose of cross-validation of the two competing hypothesized models (see MacCallum et al., 1992, 1993), we randomly split the sample. The first subsample (N = 2903; 53% boys) comprised 33.9% Secondary-1, 26.3% Secondary-2, 28.1% Secondary-3, 10% Secondary-4, and 1.7% Secondary-5 students. The mean

age of participants in subsample 1 was 14.19 years (SD = 1.28). The second subsample (N = 2870; 53% boys) comprised 33.5% Secondary-1, 28.4% Secondary-2, 28.2% Secondary-3, 8.3% Secondary-4, and 1.6% Secondary-5 students. The mean age of participants in subsample 2 was 14.17 years (SD = 1.26). Hence, the two subsamples were highly similar in their characteristics.

7.2. Procedure

A pilot study was first carried out by administering a paper-and-pencil survey to 308 students from one secondary school in Singapore. These responses were not used in the final study. The purpose of the pilot study was to ensure that students at all grades (i.e., year groups) and all streams understood the items in the questionnaire, to record the time taken to complete the questionnaire,

and to monitor all other possible issues that might be encountered in the main study. On the basis of the pilot study a few items were modified such that students could understand the items more easily. The revised questionnaire was then used in the main study.

In the main study, the questionnaire was administered in intact groups by the teachers or by trained research assistants, as deemed appropriate by the school principals. Participants were first briefed that the purpose of the questionnaire was to understand their school motivation and learning. To encourage participants' truthful answers, it was emphasized that their responses would be confidential, would not affect their school grades, and would be analysed collectively and not individually. Participants were also told that there were no right or wrong answers to any of the questions and that honest responding was of great importance in the study. It took around 45 min for the participants to complete the survey.

The participants were given the following instructions for their future goals:

"We all have goals for our life, things that we want to achieve. Not all goals will be equally important for everyone. For example, some people want to make a lot of money, others may not. Some people may want to help society, some may not. In this section, we are interested in what you want to achieve in the future. Please circle the number that is closest to the truth for you for each goal."

For the motivation questions students were given the following instructions:

"We are interested in what motivates you at school and why you try hard. Please circle the number to show how much you agree with the following goals."

The instruction and questionnaire were given and administered to the participants in English because English is the medium of instruction at all schools in Singapore. Appropriate Human Research Ethics Committee (HREC) clearance was obtained for the study.

7.3. Measures

7.3.1. Future goals questionnaire (FGQ)

As a preliminary study, a series of semi-structured interviews were conducted with 32 secondary school students from six schools. The interviews were specifically conducted to elicit students' views about the contents of their future goals, the factors that motivated them to do well in school, and school subjects they found relevant or less relevant to their future goals. Responses to the interview questions were then categorized into five substantively distinct categories of future goals. On the basis of this result, the FGQ was developed. The five 3-item FGQ subscales are as follows: career-focused future goal (e.g., I want to get a good job); fame-focused future goal (e.g., I want to become an important person in my society); wealth-focused future goal (e.g., I want to make a lot of money); family-focused future goal (e.g., I want to support my future family); and society-focused future goal (e.g., I want to develop my society). To respond to the FGQ items, participants were provided with a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). The FGQ subscales showed highly acceptable Cronbach's alpha internal consistency, ranging from $\alpha = .80$ to $\alpha = .90$ for the whole sample, from $\alpha = .82$ to $\alpha = .92$ for subsample 1, and from $\alpha = .83$ to $\alpha = .91$ for subsample 2 (see Table 1).

7.3.2. General achievement goal orientation scale (GAGOS)

Students' endorsement of mastery and performance goal orientations was assessed using the GAGOS (McInerney, Marsh, & Yeung, 2003). The two 4-item GAGOS subscales used in this study are: mastery-approach goal orientation, which measures the degree to which students are motivated by the idea of acquiring knowledge and knowing that they are improving at their academic work (e.g., I am most motivated when I am becoming better at my work) and performance-approach goal orientation, which measures the degree to which students are motivated to demonstrate that their academic competence is better than those of others (e.g., I am most motivated when I am doing better than others at school). To respond to the GAGOS items, students are asked to indicate which

Table 1
Factor loadings of the FGQ and GAGOS items based on full measurement CFA.

	Fame-focused future goal			Career-focused future goal			Wealth-focused future goal			Family-focused future goal			Society-focused future goal			Performance goal orient			Mastery goal orient		
	WS	SS 1	SS 2	WS	SS 1	SS 2	WS	SS 1	SS 2	WS	SS 1	SS 2	WS	SS 1	SS 2	WS	SS 1	SS 2	WS	SS 1	SS 2
F6fame	.72	.73	.70																		
F11fame	.94	.93	.94																		
F1fame	.89	.89	.89																		
F2career				.88	.89	.88															
F7career				.90	.90	.89															
F12career				.87	.86	.87															
F8wealth							.90	.89	.90												
F13wealth							.88	.88	.88												
F3wealth							.81	.79	.80												
F9family										.93	.94	.92									
F14family										.95	.95	.94									
F4family										.93	.94	.94									
F10society													.90	.90	.90						
F5society													.94	.93	.94						
F15society													.86	.86	.86						
A48pfm																.68	.70	.68			
A43pfm																.61	.61	.63			
A19pfm																.76	.78	.74			
A11pfm																.71	.73	.70			
A47mam																			.70	.70	.72
A29mam																			.81	.80	.82
A27mam																			.80	.81	.80
A23mam																			.72	.72	.70
Alpha	.82	.84	.83	.80	.84	.84	.80	.82	.83	.90	.92	.91	.88	.89	.89	.74	.75	.74	.75	.78	.79

Note: SS 1 = subsample 1; SS 2 = subsample 2; WS = whole sample.

Table 2
Descriptive statistics, internal consistency, and inter-variable correlations based on a full measurement CFA.

No.	Variable	Whole sample							Subsample 1							Subsample 2						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1.	Fame FG	–							–							–						
2.	Wealth FG	.57	–						.55	–						.58	–					
3.	Career FG	.49	.78	–					.50	.78	–					.49	.78	–				
4.	Society FG	.56	.35	.53	–				.60	.36	.55	–				.57	.35	.53	–			
5.	Family FG	.40	.62	.81	.58	–			.42	.63	.82	.60	–			.41	.61	.81	.57	–		
6.	Performance GO	.49	.37	.39	.36	.32	–		.51	.35	.40	.38	.34	–		.49	.38	.39	.37	.33	–	
7.	Mastery GO	.27	.22	.43	.39	.38	.73	–	.26	.19	.41	.40	.35	.73	–	.28	.24	.44	.43	.41	.71	–
	Mean	3.53	4.26	4.50	4.01	4.54	3.33	3.89	3.53	4.20	4.49	4.00	4.52	3.32	3.87	3.52	4.21	4.51	4.02	4.55	3.33	3.90
	SD	.91	.72	.50	.79	.57	.83	.68	.94	.76	.59	.80	.64	.83	.72	.93	.77	.59	.80	.62	.82	.72

Note: All correlations are significant at $p < .001$; GO = goal orientation.

academic situation motivates them most in their study on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). The Cronbach's alpha reliability for mastery-approach and performance-approach goal orientation subscales, respectively, were $\alpha = .75$ and $\alpha = .74$ for the whole sample, $\alpha = .78$ and $\alpha = .75$ for subsample 1, and $\alpha = .79$ and $\alpha = .74$ for subsample 2 (see Table 1).

A confirmatory factor analysis (CFA) was conducted to examine construct validity and the appropriateness of both the FGQ and GA-GOS items for our sample. The CFA was conducted based upon a full measurement model comprising seven interrelated latent variables representing the five future goals and the two achievement goal orientations (see Liem et al., 2008; Martin, 2006 for a similar procedure). A set of items hypothesized a priori to be indicators of a latent variable served as observed variables, or indicators, of the latent variable. The following goodness-of-fit indices of this CFA model were found for the whole sample: $\chi^2 = (209, N = 5773) = 8853.87$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05; for subsample 1: $\chi^2 = (209, N = 2903) = 4048.87$, CFI = .97, NNFI = .97, RMSEA = .08, and SRMR = .05; and for subsample 2: $\chi^2 = (209, N = 2870) = 4002.83$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .04 (see Section 7.4 for the selection of fit indices and their cut-off values). All factor loadings, presented in Table 1, were significant at $p < .001$. Taken together, these findings demonstrate evidence of the construct validity of the FGQ and GAGOS items for use with our sample.

7.4. Statistical analysis

The main analyses involved confirmatory factor analysis (CFA) and structural equation modeling (SEM). These were performed using LISREL 8.80 (Jöreskog & Sörbom, 2006). Typically, the researcher posits an a priori factor structure of the measures (in CFA) or hypothesizes a model that depicts structural relationships of latent factors (in SEM). The researcher then tests the validity of a solution based on the fit of the posited factor structure or the hypothesized structural relationships by showing that: (a) the solution is well defined, (b) the parameter estimates are consistent with theory and a priori predictions, and (c) the subjective indices of fit are conventionally acceptable (McDonald & Marsh, 1990). Maximum likelihood was the method of estimation used for the CFA and SEM in this study as it is generally regarded as a robust method with moderate to large sample sizes (see Hoyle, 1995).

In evaluating the fit of the data to alternative models in CFA and SEM, a range of goodness-of-fit indices were assessed. Following recommendations on establishing model fit (e.g., Marsh, Hau, & Wen, 2004), the Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI), the Root Mean Square Error of Approximation (RMSEA), the χ^2 test statistic, and an evaluation of parameter estimates were used in the present research to assess model fit. The

RMSEA index is less affected by sample size than the χ^2 test statistic and values at or less than .08 and .05 are taken to reflect acceptable and excellent fit respectively (see Marsh, Balla, & Hau, 1996; Yuan, 2005). The NNFI and CFI vary along a 0-to-1 continuum in which values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fit to the data respectively (McDonald & Marsh, 1990). The CFI contains no penalty for a lack of parsimony so that improved fit due to the introduction of additional parameters may reflect capitalization on chance, whereas the NNFI and RMSEA contain penalties for a lack of parsimony (Yuan, 2005). Further, in the case that a researcher avoids type I error (e.g., obtaining a significant χ^2 due to a large sample size like in the present study), Hu and Bentler (1995) recommended using the CFI and the standardized root mean square residual (SRMR), with SRMR values below .08 are considered a good fit.

8. Results

8.1. Preliminary analysis

8.1.1. Descriptive statistics
Table 2 shows the means (*M*), standard deviations (*SD*) and correlations among the variables in the study for the whole sample and subsamples 1 and 2. These correlations were derived from the full measurement CFA model and take into account errors of measurement. While there is no statistical test to establish whether the means for different variables are significantly different from each other, for the whole sample, subsample 1, and subsample 2, family-oriented future goal (*M* = 4.54, *M* = 4.52, and *M* = 4.55, respectively) and career-oriented future goal (*M* = 4.50, *M* = 4.49, and *M* = 4.51, respectively) were the two most highly endorsed future goals. In contrast, fame-oriented future goal was the least endorsed (*M* = 3.53, *M* = 3.53, and *M* = 3.52, respectively). In terms of academic goal orientation, mastery goal orientation was more highly endorsed (*M* = 3.89, *M* = 3.87, and *M* = 3.90, respectively) than performance goal orientation (*M* = 3.33, *M* = 3.32 and *M* = 3.33, respectively).

8.1.2. Relationships among variables
As seen in Table 2, for the whole sample, subsample 1, and subsample 2, career-oriented future goal was found to be highly correlated with family-oriented future goal (*r* = .81, *r* = .82, and *r* = 81, respectively) and wealth-oriented future goal (all *r*s = .78 for the whole sample and the two subsamples). Other future goals were found to be moderately correlated. These included society-oriented and fame-oriented future goals (*r* = .56, *r* = .60, and *r* = .57, respectively); wealth-oriented and fame-oriented future goals (*r* = .57, *r* = .55, and *r* = .58, respectively); society-oriented and family-oriented future goals (*r* = .58, *r* = .60, and *r* = .57, respectively); and

career-oriented and society-oriented future goals ($r = .53$, $r = .55$, and $r = .53$, respectively). Wealth-oriented and society-oriented future goals were modestly correlated ($r = .35$, $r = .36$, and $r = .35$, respectively). The two achievement goal orientations were found to be highly correlated for the whole sample ($r = .73$), subsample 1 ($r = .73$), and subsample 2 ($r = .71$).

In line with our predictions, for the whole sample, subsample 1, and subsample 2, fame-oriented future goal was more highly correlated with performance goal orientation ($r = .49$, $r = .51$, and $r = .49$, respectively) than with mastery goal orientation ($r = .27$, $r = .26$, and $r = .28$, respectively). Using the Fisher r-to-z transformation, we carried out a series of tests of significance difference between two correlation coefficients (one-tailed). The z-test results showed that fame-oriented future goal was indeed associated with performance goal orientation significantly more highly than with mastery goal orientation for the whole sample ($z = 13.92$, $p < .001$), subsample 1 ($z = 11.30$, $p < .001$), and subsample 2 ($z = 9.40$, $p < .001$). Similarly, wealth-oriented future goal was also found to be more highly correlated with performance goal orientation ($r = .37$, $r = .35$, and $r = .38$, respectively) than with mastery goal orientation ($r = .22$, $r = .19$, and $r = .24$, respectively). Z-test indicated that wealth-oriented future goal was indeed statistically more highly associated with performance goal orientation than with mastery goal orientation for the whole sample ($z = 8.85$, $p < .001$), subsample 1 ($z = 6.59$, $p < .001$), and subsample 2 ($z = 5.88$, $p < .001$).

Also in support of our predictions, society-oriented future goal was more highly correlated with mastery goal orientation ($r = .39$, $r = .40$, and $r = .43$, respectively) than with performance goal orientation ($r = .36$, $r = .38$, and $r = .37$, respectively). Z-test showed that society-oriented future goal was associated more highly with mastery goal orientation, albeit marginally, than with performance goal orientation. This was true for the whole sample ($z = -1.88$, $p < .05$) and subsample 2 ($z = -2.71$, $p < .01$), but not for subsample 1 ($z = -0.9$, ns). Family-oriented future goal was also found to be more highly correlated with mastery goal orientation ($r = .38$, $r = .35$, and $r = .41$, respectively) than with performance goal orientation ($r = .32$, $r = .34$, and $r = .33$, respectively). Z-test showed that family-oriented future goal was associated significantly more highly with mastery goal orientation than with performance goal orientation for the whole sample ($z = -3.67$, $p < .001$) and subsample 2 ($z = -3.51$, $p < .001$), but not for subsample 1 ($z = -0.43$, ns). Lastly, career-oriented future goal was more highly correlated with mastery goal orientation ($r = .43$, $r = .41$, and $r = .44$, respectively) than with performance goal orientation ($r = .39$, $r = .40$, and $r = .39$, respectively). Z-test showed that career-oriented future goal was associated significantly more highly with mastery goal orientation, albeit marginally, than with performance goal orientation. This was true for the whole sample ($z = -2.58$, $p < .01$) and subsample 2 ($z = -2.29$, $p < .05$), but not for subsample 1 ($z = -0.46$, ns). On the whole, the results reported above provided full support to the hypothesis that fame-oriented and wealth-oriented future goals would be more highly associated with performance goal orientation than mastery goal orientation. The results also provided support to our second hypothesis that society-oriented, career-oriented, and family-oriented future goals would be more highly correlated with mastery goal orientation than performance goal orientation for subsample 2 and the whole sample, but not for subsample 1.

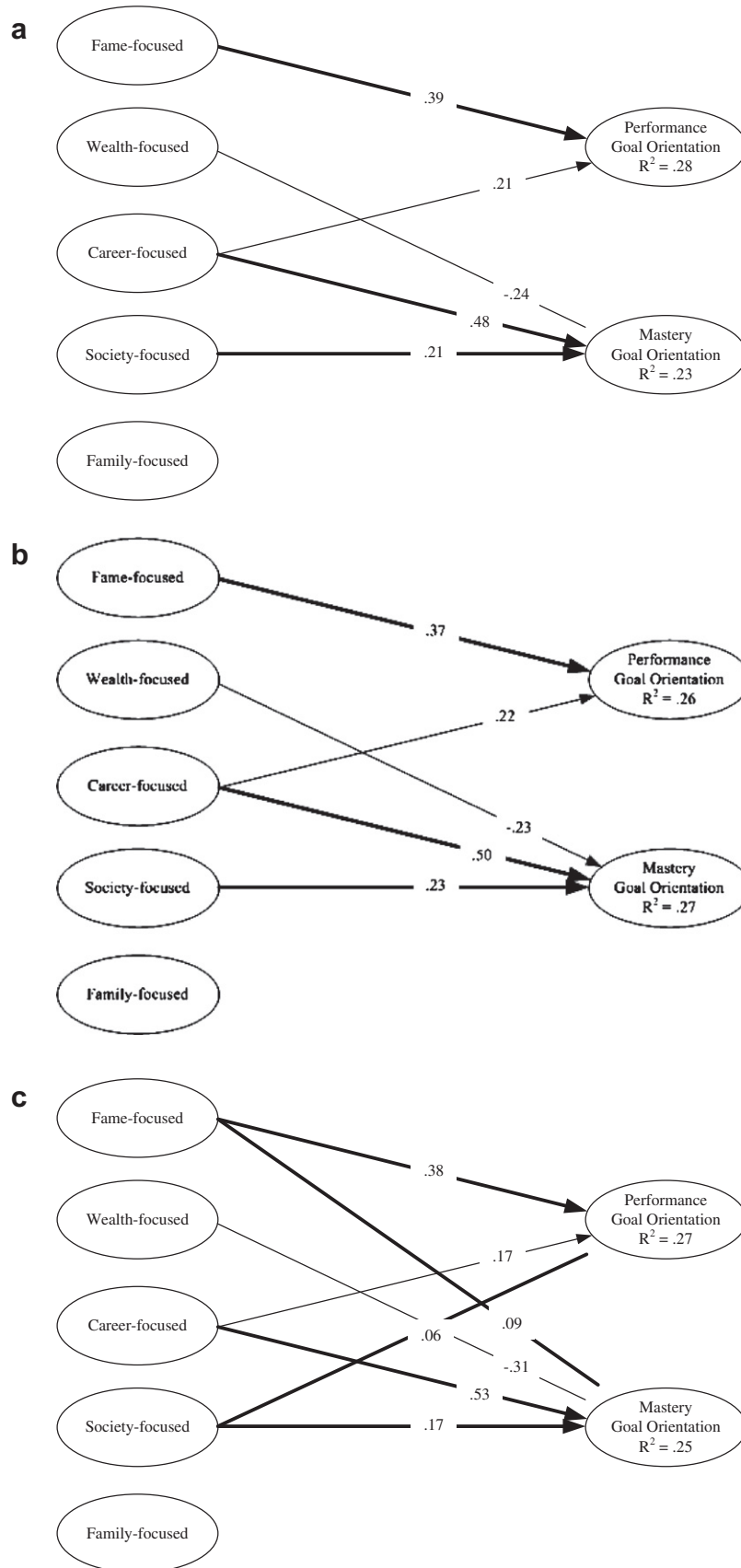## 8.2. Main analysis

8.2.1. Testing model A

Having examined bivariate correlations between future goals and achievement goal orientations, we now considered all the goal constructs in one single analytic model using SEM. First, we tested the hypothesized Model A, in which future goals predict achieve-

ment goal orientations. In this model, covariances amongst the five future goals and between the two achievement goal orientations were freed. The first test was conducted with subsample 1 as a calibration sample. The fit indices suggest that the dataset fit Model A well: $\chi^2 = (209$, $N = 2903) = 4586.25$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05. The results showed that five parameters were not statistically significant at $p < .01$ or $t \leqslant |2.58|$ (given the large sample size involved in this study, a more conservative significance value $p < .01$ was used to avoid Type 1 error). These non-significant parameters included those from fame-oriented future goal to mastery goal orientation ($\beta = .05$, $t = 1.89$), from wealth-oriented future goal to performance goal orientation ($\beta = .01$, $t = 0.02$), from society-oriented future goal to performance goal orientation ($\beta = .06$, $t = 2.13$), and from family-oriented future goal to both performance and mastery goal orientations ($\beta = .01$, $t = 0.34$ and $\beta = .04$, $t = 1.07$, respectively). These non-significant paths were then systematically removed from the model. The modified Model A was re-run and the fit indices generated were slightly better than those of the first model: $\chi^2 = (214$, $N = 2903) = 4604.37$, CFI = .97, NNFI = .97, RMSEA = .08, and SRMR = .05. A χ^2 test performed to compare these two nested models showed that the modified Model A (see Fig. 2a) was a significantly better model than Model A ($\Delta\chi^2 = 18.12$, $df = 5$, $p < .01$).
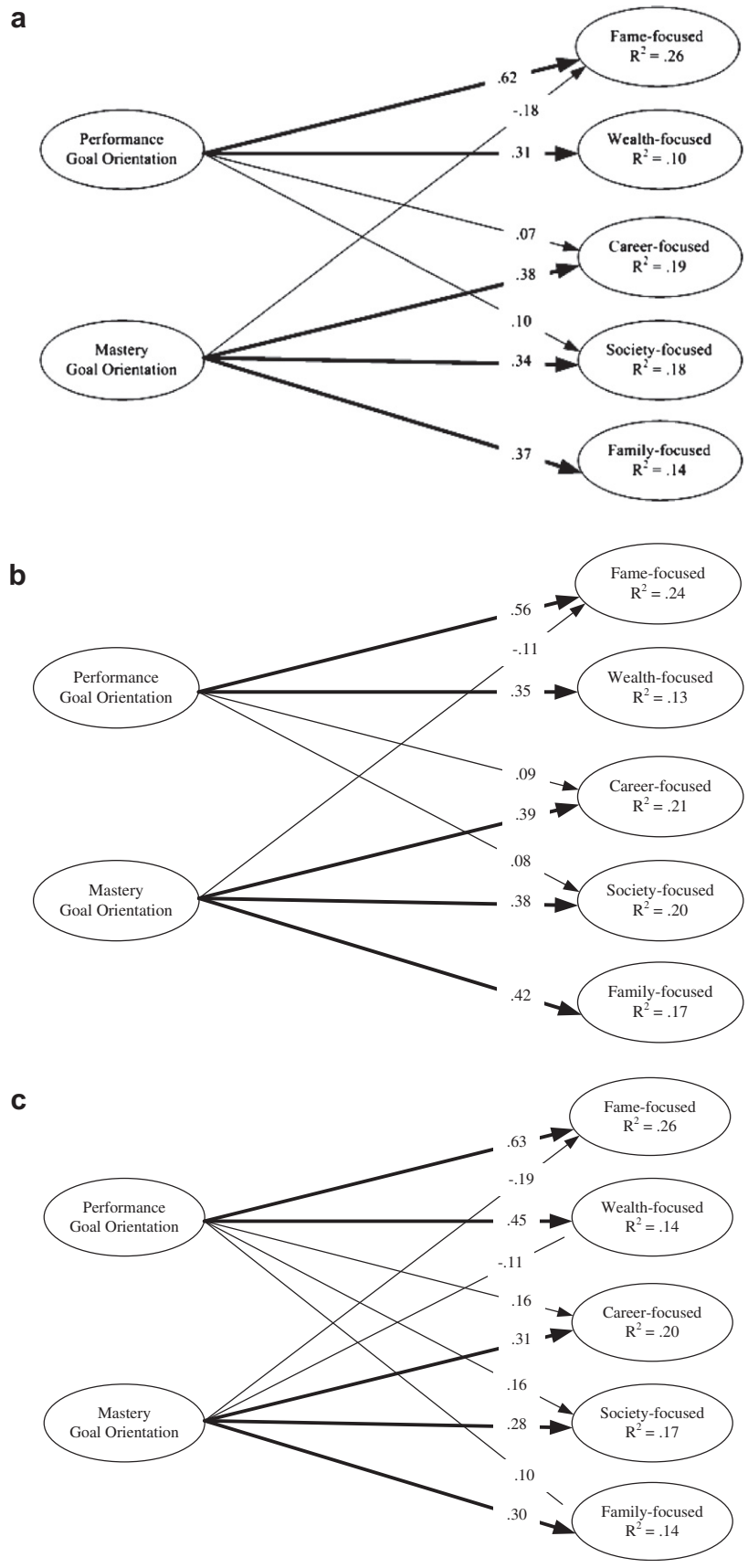
As recommended by MacCallum et al. (1992, 1993), we then tested the modified Model A with subsample 2 as a cross-validation sample. The resulting beta parameters were remarkably similar in the magnitude and the fit indices also fell in the same range: $\chi^2 = (214$, $N = 2870) = 4013.34$, CFI = .97, NNFI = .97, RMSEA = .08, and SRMR = .05 (see Fig. 2b). This finding suggests that the modified Model A was neither generated out of the idiosyncrasies associated with subsample 1 nor capitalization upon chance (MacCallum et al., 1992, 1993). For completeness, we also tested the hypothesized Model A with the whole sample dataset. The fit indices suggest that the data fit the model well: $\chi^2 = (209$, $N = 5773) = 8853.87$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05. Three parameters were found to be non-significant at $p < .01$: one from wealth-oriented future goal to performance goal orientation ($\beta = -.01$, $t = -.029$), and two from family-oriented future goals to both performance and mastery goal orientations ($\beta = -.01$, $t = -.40$ and $\beta = .01$, $t = .06$, respectively). Removing these parameters resulted in the same range of indices: $\chi^2 = (212$, $N = 5773) = 8854.65$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05. This modified model was not statistically better than the hypothesized model A ($\Delta\chi^2 = 0.78$, $df = 3$, ns). Based on a parsimony principle, however, the modified model (see Fig. 2c) was more desirable to represent the whole sample dataset.

8.2.2. Testing model B

Next, we tested the hypothesized Model B, in which achievement goal orientations predict future goals. The first test was performed with subsample 2 as a calibration sample (see MacCallum et al., 1992, 1993 for the shift in the designation between calibration and cross-validation samples when testing alternative or competing models). The result indicated a good fit: $\chi^2 = (209$, $N = 2870) = 4002.83$, CFI = .97, NNFI = .97, RMSEA = .08, and SRMR = .04. Two parameters, however, were not statistically significant at $p < .01$. These included a parameter from performance goal orientation to family-oriented future goal ($\beta = .07$, $t = 2.34$) and a parameter from mastery goal orientation to wealth-oriented future goal ($\beta = -.06$, $t = -1.74$). These parameters were removed and the analysis was re-run. The modified Model B also showed a good fit to the data: $\chi^2 = (211$, $N = 2870) = 4020.25$, CFI = .97, NNFI = .97, RMSEA = .08, and SRMR = .05 (see Fig. 3a). A χ^2 test showed that the modified Model B was statistically better than Model B ($\Delta\chi^2 = 17.42$, $df = 2$, $p < .001$). We then tested the modified Model B with subsample 1 as a cross-validation sample, and found the fol-

Fig. 2. Results of testing hypothesized Model A with subsample 1 as a calibration sample (Fig. 2a), subsample 2 as a cross-validation sample (Fig. 2b) and the whole sample (Fig. 2c). Note: all parameters are significant at $p < .001$; for clarity of presentation, observed/manifest variables and covariances amongst the five future goals and between the two achievement goal orientations are not presented; bolded lines represent the relationships between constructs with the same valence and non-bolded lines represent the relationships between constructs with opposite valences.

Fig. 3. Results of testing hypothesized Model B with subsample 2 as a calibration sample (Fig. 3a), subsample 1 as a cross-validation sample (Fig. 3b) and the whole sample (Fig. 3c). Note: all parameters are significant at $p < .001$; for clarity of presentation, observed/manifest variables and covariances amongst the five future goals and between the two achievement goal orientations are not presented; bolded lines represent the relationships between constructs with the same valence and non-bolded lines represent the relationships between constructs with opposite valences.

lowing indices: $\chi^2 = (211, N = 2903) = 4587.29$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05. The beta parameters in the modified Model B based on this cross-validation sample (Fig. 3b) were remarkably similar to those based on the calibration sample (Fig. 3a). Testing the hypothesized Model B with the whole sample dataset resulted in a good fit: $\chi^2 = (209, N = 5773) = 8853.57$, CFI = .97, NNFI = .96, RMSEA = .08, and SRMR = .05. All paths from achievement goals orientations to future goals were significant (see Fig. 3c).

Further, we performed a series of χ^2 tests to ascertain whether one of the two modified nested models (i.e., modified Model A and modified model B) is statistically different from one another in its fit to the subsamples 1 and 2 datasets, respectively. As described above, the subsample 1 dataset fitted the modified model A with $\chi^2 = (214, N = 2903) = 4604.37$ (see Fig. 2a) and fitted the modified model B with $\chi^2 = (211, N = 2903) = 4587.29$ (see Fig. 3b). The χ^2 test suggests that the two modified models were statistically different from one another in their fit to the subsample 1 dataset ($\Delta\chi^2 = 17.08$, $df = 3$, $p < .001$). In this respect, the modified model B is substantively more desirable because family-oriented future goal was predicted significantly by one of the achievement goal orientations (i.e., mastery-approach goal orientation), whereas in the modified model A this future goal was not associated with any achievement goal orientation (see Section 9). The subsample 2 dataset fitted the modified model A with $\chi^2 = (214, N = 2870) = 4013.34$ (see Fig. 2b) and fitted the modified model B with $\chi^2 = (211, N = 2870) = 4020.45$ (see Fig. 3a). The χ^2 test suggests that both the modified model A and the modified model B fitted the subsample 2 dataset equally well ($\Delta\chi^2 = 7.11$, $df = 3$, ns). The whole sample dataset fitted the modified model A with $\chi^2 = (212, N = 5773) = 8854.56$ (see Fig. 2c) and fitted the modified model B with $\chi^2 = (209, N = 5773) = 8853.57$ (see Fig. 3c). The χ^2 test suggests that both the modified model A and the modified model B fitted the whole sample dataset equally well ($\Delta\chi^2 = 0.99$, $df = 3$, ns).

9. Discussion

Using an intrinsic–extrinsic framework we set out in this study to investigate the relationships between students' future goals and their achievement goal orientations. We hypothesized that achievement goal orientations and future goals of the same valence (intrinsic–intrinsic or extrinsic–extrinsic) would be more strongly and positively related to each other than achievement goal orientations and future goals of different valences (intrinsic–extrinsic). We were also interested in the direction of the relationships, that is, whether future goals were predictors of achievement goals (Model A), or achievement goal orientations were predictors of future goals (Model B).

9.1. Endorsement of achievement goal orientations

Our findings show that the students in our study held both mastery-approach and performance-approach goal orientations, even though mastery-approach goal orientation was endorsed more highly than performance-approach goal orientation. The moderate positive correlation observed between mastery-approach and performance-approach goal orientations suggests that the two are not mutually exclusive. That is, students can endorse mastery-approach oriented and performance-approach oriented goals at the same time and to a similar degree. The absence of a negative correlation between the two goal orientations suggests that these goal orientations are more likely to be conceptually separate constructs rather than opposing poles of a single goal orientation construct continuum. This result is consistent with a review by Lepper

et al. (2000, p. 273) concluding that intrinsic and extrinsic motivation constructs "ought frequently to coexist" in the real world settings, as well as with prior research with Asian students (see e.g., Ho et al., 2007; Liem et al., 2008; Salili & Lai, 2003).

This shows that, for some students and/or in certain educational contexts, a combined adoption of mastery-approach and performance-approach goal orientations may be more adaptive than endorsing only a mastery-approach goal orientation or a performance-approach goal orientation (e.g. Farr, Hofmann, & Ringenbach, 1993; Roebken, 2007; Senko & Miles, 2008). In the context of Singapore's competitive and examination-driven educational system where admission to higher levels of education is based on examination grades, it appears that students cannot 'afford' to focus and spend their energy and time only on fulfilling their interest in a particular subject without paying attention to the normative standard of achievement (Senko & Miles, 2008). In other words, a mastery-approach goal orientation may become a source of motivation for students to engage in a learning task out of the passion about and interest in the task. Nevertheless, these students are also motivated to engage in the task by the idea that their achievement should surpass, or at least should not be worse than, those of their classmates if they are to further their studies (see Senko & Miles, 2008).

9.2. Endorsement of future goals

Our results also show that Singaporean secondary school students saw supporting family members, having a good career, and having a lot of money or material possessions as important goals to pursue in the future relative to contributing to the society or becoming a famous person in the society. This finding is consistent not only with prior research with Singaporean secondary school students (Huan, Yeo, Ang, & Chong, 2008) demonstrating that family-related goals was the top of their future concerns, but also with studies conducted in non-Asian cultures. Reviewing past studies on future goals and concerns of adolescents in Anglo-Saxon cultures (e.g., America, Germany, Scotland, Netherland, and Finland), for example, Nurmi (2005) found that future occupation, future family, and material wealth as important future concerns. Further, when asked about their fears and worries about their future, many of them report various concerns including unemployment and unhappy marriage. Similarly, conducting a study with English adolescents, Gillies (1989) found a similar pattern, in which career, healthy family, and money were adolescents' prominent concerns.

9.3. Correlational analyses

Correlational analyses indicate a stronger relationship between like valenced future goals than opposite valenced future goals which provides some validation support for our categorization of future goals as intrinsic and extrinsic, and some evidence supporting our contention that like valenced goals should be more strongly related than unlike valenced goals. The strongest evidence for this (referring to the whole sample, see Fig. 3c) are the correlations between fame and wealth, career and family, society and family. Wealth, categorized as extrinsic, was somewhat problematic as it had high correlations with society, career and family, all of which were categorized as intrinsic future goals. This suggests that students who place high importance in supporting their future families, having a good career and contributing to society are likely to perceive having wealth an important factor related to these other goals. In this sense, wealth might be seen as a means to achieve his or her other future goals or as a proxy for these goals. Conversely, students who place high importance on earning a lot of money may regard having a good career a means to achieving this goal, and may also perceive that in order to contribute to their fam-

ily and society they need wealth. The high correlations observed among the different future goals suggest that it is possible for a student to hold more than one future goal simultaneously, which probably indicates that some future goals are endorsed as a means to achieve other future goals. Unfortunately, our current data do not allow us to explore the underlying explanations for these correlations. Further research will be needed to examine causal relationships using longitudinal data, experimental design, or qualitative method (e.g., interviews, focus group discussions).

We also hypothesized that like valenced achievement goals and future goals would be more strongly and positively correlated than opposite valenced achievement goal orientations and future goals. Intrinsic future goals were, in most instances, more strongly associated with a mastery-approach goal orientation while extrinsic future goals were more strongly associated with performance-approach goal orientation. These findings help to affirm the construct validity of the scales applied in this research and support out hypothesis.

9.4. Direction of effect

We proposed two models to study direction of effect, one in which future goals were considered to be predictors of achievement goal orientations (Model A) and one in which achievement goals were predictors of future goals (Model B). Comparing the two competing models, we found a similar pattern in the relationships between future goals and achievement goal orientations, in which mastery goal orientation was positively and more strongly associated with intrinsic future goals (career-, society-, and family-oriented future goals) than with extrinsic future goals (fame- and wealth-oriented future goals). Structural equation modeling showed that the direction depicting the two achievement goal orientations as the predictors of the five future goals (Model B) emerged as a more heuristic model. All paths are significant and the paths are in line with our predictions (refer to Fig. 3c), giving strong support to our theorizing. Specifically, we found there are strong positive paths between like valenced goals and weaker paths between opposite valenced goals. Furthermore, the paths between mastery-approach goal orientation and the two extrinsic future goals (fame and wealth) are negative, which provides further validation evidence of the categorizing of the variables as intrinsic or extrinsic. While the paths from performance-approach to the intrinsic future goals are also significant and positive they are less so than the paths from mastery-approach goals to the intrinsic future goals. This suggest, in line with extant research and theorizing, that performance-approach goals function in a manner similar to mastery-approach goals (see, for example, Pekrun et al., 2009). However, the fact that the paths from mastery-approach to the extrinsic future goals were significant and negative suggests that mastery goal orientation is qualitatively different from performance-approach goal orientation. In comparison with Model B, Model A testing the paths from the future goals to achievement goals is less heuristic although it provides some support for the like-valence hypothesis. We understand that one wave of data does not allow testing of causality, but the patterns uncovered, particularly with Model B, are suggestive and allow future testing of causality through multi-time data.

These results provide us with a number of interesting and important pieces of information to enhance our understanding of school motivation. First, it appears that both achievement goals and future goals can be categorized as intrinsic and extrinsic which enables researchers and practitioners to tap into the voluminous research literature on intrinsic motivation to explore further the implications of these categorizations and the potential synergies between intrinsic motivation, mastery-approach goal orientation and intrinsic future goals that may be invoked by educators to enhance engagement in learning. Second, on an ordinal rank ordering, intrinsic achievement and future goals are, in general, more highly endorsed than extrinsic goals. This provides an optimistic insight into the values, beliefs and aspirations of students in educational settings. Third, like valenced goals do have stronger relationships with each other than unlike valenced goals suggesting a synergy that may be further capitalized upon. However, what is not evident from these analyses is whether there might be an additive or multiplicative effect operating. Further longitudinal studies could tease out this issue and compare direct, indirect and total effects on appropriate achievement outcomes. Fourth, the apparent superiority of achievement goals in predicting future goals, rather than the other way around, suggests that an emphasis on encouraging mastery-approach and performance-approach orientations may be beneficial for enhancing a range of students' life-ambitions. In particular it would appear that if students are highly mastery-approach oriented the more likely they are to aspire to intrinsic future goals. Again, it is necessary to test this theorizing with longitudinal data.

Our analysis suggests that intrinsic future goals are strongly related to mastery goal orientation which is generally related to a host of positive educational traits and outcomes (Harackiewicz et al., 2002a, 2002b; see also Midgley et al., 2001; Sideridis, 2005). In line with this, and in line with many other studies, an emphasis on mastery-approach motivation therefore seems warranted. As documented in past literature, mastery-approach goal orientation increases students' interest and the amount of time they spend on learning tasks (Kaplan et al., 2002; Senko & Harackiewicz, 2005), as well as engaging students in a deeper learning process (Covington, 2000; Gabriele, 2007). Moreover, past research has also documented a positive relationship between intrinsic future goals and students' well-being. An emphasis on future goals such as contributing to society or developing one's career may also be beneficial to student learning. In contrast, if students perceive education mainly as a means to enhance one's status or wealth, students may be less likely to commit to meaningful learning, further their studies, and perform well (Nicholls et al., 1985; Vansteenkiste et al., 2006; Wilding & Andrews, 2006). Our findings suggest that if educators wish to encourage future goals that are intrinsic in nature, which have been shown to be related to positive outcomes, emphasizing the adoption of mastery goal orientation in the classroom setting may be an effective way of doing this. Again we note that we cannot ascertain from our data whether emphasizing one (intrinsic achievement goals) may lead to the adoption of the other (intrinsic future goals), or whether emphasizing both may lead to multiplicative or additive beneficial effects. We further caution that the relationships are speculative in the absence of longitudinal data. Nevertheless, drawing upon the consistent relationships between mastery-approach goal orientation with intrinsic future goals in this research, and the consistent relationship between mastery-approach goal orientation and positive learning outcomes replicated many times in other studies, we suggest that teachers and parents should encourage students to focus on mastery goal orientation. This may in turn promote intrinsic future goals rather than extrinsic future goals, which consequently may lead to better learning quality and positive personal benefits for students. In view of these findings, however, future research should also include achievement outcome measures (such as grade point average) to test this prediction empirically.

9.5. Limitation of the study and future direction

Our conclusions are limited by the fact that this study only tested the relationship between achievement goal orientations and future goals in the general academic domain. Goal theories suggest that the goal orientations one holds may be affected by the situational factors or context one is in. It will be useful if future

research is extended into different academic domains (e.g., mathematics, English). Although the fit indices from SEM for our proposed model look promising, we should also be mindful that this does not denote that our data would not fit other types of relationships. Future research should go beyond survey method to investigate the relationships proposed in this paper. It will also be meaningful to see how the (in)congruent relations between future goals and achievement goal orientations will (or will not) influence students' academic performance. It is important to note that some of our interpretation is speculative in the absence of longitudinal data. Nevertheless, the findings give a solid base for designing a longitudinal study to further tease out any causal relationships that might exist between achievement goals, future goals and school achievement. As the sample was drawn from Singapore the results may not be generalizable and replication in other cultural settings would be an important next step in validating the results.

10. Conclusion

As indicated earlier, the study of achievement goals and future goals has proceeded relatively independently. When these theoretical perspectives are integrated they may provide a more complete picture of the dynamics of school engagement. In this study, we examined the relationships between future goals (fame-, wealth-, society-, family-, and career-oriented) and achievement goal orientations (mastery-approach and performance-approach goals) among Singaporean secondary school students. Our findings suggest that like valence achievement goal orientation and future goals are likely to go hand-in-hand. Therefore, if one can induce an intrinsic–intrinsic achievement goal orientation-future goals combination in students, his or her goal profile may become more mutually strengthening. We assume that when one's present goal orientation aligns with his or her aspirations for the future, one will be more readily able to maintain the goal orientation he or she has chosen to adopt.

These data also offer some insights for goal setting, be it future goals or immediate achievement goals. By linking the two concepts, we offer teachers an alternative way to look at goals and a guide to understand what it may mean to inculcate certain (goal) orientations in our next generation. The mere focus on promoting either mastery goal orientation or intrinsic future goals in the classroom may be too short-sighted a teaching practice. Teachers should be mindful not only of the achievement goal orientations they encourage but also of the related future goals that may come along with these. Our study adds to the scarce research looking into the relationship between congruent future goals and achievement goal orientations, and thus extends the motivation literature by linking the two important constructs in a heuristic and meaningful way.

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