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Towards a Better Understanding of Goal Orientations

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Abstract

The present research comprises three studies with the overarching aim of developing a motivation questionnaire. The theoretical backbone of this questionnaire is the 3-factor model consisting of mastery goal, performance goal and surface goal. Undergraduate students were sampled. In study 1, participants' responses to a semi-structured interview were used to inform the design of items that capture the three factors. Through exploratory factor analysis, study 2 found that the items designed loaded on the three hypothesized factors. The questionnaire was revised, discarding items that did not load well on the intended factor. Study 3 involved replicating study 2; confirmatory factor analysis was conducted. After removing items that double-loaded, the questionnaire demonstrated good fit. Findings of this research also add to our understanding of dynamics of the 3 goals of interest. The questionnaire developed would be useful for future research, particularly in the Singapore academic context.

Motivation is related to academic performance; research clearly supports this claim (Lam & Law, 2007; Robbins et al., 2004; Robbins, Le & Lauver, 2005). The relationship has been found to be positive, that is to say, a motivated individual is likely to perform well academically. This piece of finding, though informative, has led to some wrong inferences. One such misinterpretation is that when an individual performs poorly, it is because he or she is unmotivated. This is not necessarily the case, as will be mentioned later in this paper. Though such simplistic preconceptions seem to help the individual organise information and make sense of the people around them, it is not beneficial to our understanding of motivation as a construct. One must consistently seek out empirical evidence to better the prevailing conceptualisation of motivation.

The field of motivation has moved away from a polar high-low conception, to a more multidimensional conceptualization of motivation; where it is the type of motivation rather than the level of motivation that is linked to performance. Presently, there are several types of motivation distinguished, including extrinsic vs. intrinsic motivation (Ryan & Delci, 2000; Vallerand et al., 1992), approach vs. avoidance motivation (Carver, 2006; Sullivan et al., 2006), and mastery vs. performance motivational goal orientations (Elliott & Dweck, 1988; Nicholls, 1989). Among the more commonly used measures, Academic Motivation Scale designed by Vallerand et al. (1989), has shown good reliability (Legault, Green-Demers, & Pelletier, 2006; Otis, Grouzet, & Pelletier, 2005; Ratelle et al., 2005). There are, however, problems associated with using available scales without examining the validity of the underlying framework in the context of interest; reported Cronbach alphas may suggest good reliability but are not an appropriate estimate of validity. Unquestioned use of such scales also ignores the possibility of differences in the motivation construct across cultures. "Achievement motivation is largely social psychological in nature…" (Maehr, 2008, pp. 918). The social make-up of different cultures differ, hence it is important to give due consideration

to possible differences in the context in which the scale was designed and the context in which the scale is to be administered. Also, interpretations of the same items in a questionnaire may differ in different social contexts. In another area of research, Chao (1994) discovered that Chinese participants were more likely to endorse items designed to capture authoritarian parenting – then regarded as a less effective parenting style – compared to their Caucasian counterparts. However, upon further examination, it was discovered that in the Chinese culture, authoritarian parenting (as captured by the items) was deemed to facilitate the training of children. This is unlike the more controlling and restrictive connotations it held in the Caucasian culture. This finding demonstrated the need to look at concepts from within the culture rather than impose pre-defined concepts on the culture. It is therefore important to expand the "consideration of the varying nature of achievement motivation as it occurs from place to place and within this or that achievement setting" (Maehr, 2008, pp. 918). With regards to motivational measures, it is necessary for users to consider the validity of the theoretical backbone of the scales in the context of their research before using it to make conclusions about motivation and its dynamics in their studies.

One increasingly popular approach in understanding motivation is the achievement goal theory. Achievement goals are defined as the purpose of task engagement (Nicholls, 1989 as cited in Elliot & Church, 1997). This theory posits that goals create a framework for how individuals interpret, experience and act in their achievement pursuits (Nicholls, 1989). It is important to note that goals are domain-specific (Cho, 2008). That is to say, an individual can possess different goal orientations for different subjects. Conventionally, two constructs were examined – mastery and performance goals (Ames, 1992; Nicholls, 1984). Mastery goal focuses on the "development of competence and task mastery" while performance goal focuses on the "demonstration of competence relevant to others" (Elliot & Church, 1997, pp. 218). The two goals have also been referred to as learning and

performance (Bouffard et al., 1995; Elliott & Dweck, 1988) or task-oriented and ego-oriented

(Nicholls, 1989; Skaalvik, 1997) in other research. Though there are some differences

between the terms (as a result of differences in the models they were derived), researchers

(Midgley, Kaplan & Middleton, 2001; Pintrich, 2000) generally agree that the terms capture

similar ideas. People with learning goals "seek to increase their ability or master new tasks"

while people with performance goals "seek to maintain positive judgements of their ability

and avoid negative judgements by seeking to prove, validate, or document their ability and

not discredit it" (Elliott & Dweck, 1988, pp. 5). Task-oriented individuals "focus on the task

rather than extrinsic rewards…and perceptions of ability are self-referenced" while ego-

oriented individuals are "concerned with being judged able, and perceptions of ability tend to

be normatively referenced" (Skaalvik, 1997, pp. 71). We observe that in each pair, the goals

are differentiated by the point of reference – self or others. In all pairings, the former term

portrays an individual aiming to improve on his or her existing standard while the latter

portrays an individual seeking to meet or better the standard set by others (e.g., parents,

teachers and peers). The present research agrees with the view put forward by the *Handbook

of Child Psychology* (Wigfield et al., 2006) and adopts the "mastery" and "performance"

terms throughout this report.

The classic achievement motivation theorists (as referred to by Elliot and Church,

1997) took a different approach in their study of motivation. Instead of focusing on goal

orientations, these theorists suggested that behaviour in achievement settings (such as schools)

is oriented towards one of two outcomes – success or failure. In each achievement setting, an

individual is presented with the possibility of success and the possibility of failure. One's

hope of success and fear of failure work separately to produce a resultant motivation; either

approach or avoidance motivation. The hope of success sensitizes the individual to the

positive and drives him to approach his aim in the situation. On the other hand, fear of failure

sensitizes the same individual to the negative, driving him to avoid his fear. If the hope of success is greater than the fear of failure, approach motivation results. If fear of failure is stronger than the hope of success, then avoidance motivation results. Achievement motivation theorists acknowledge that though individuals exhibit the same presenting behaviour (for instance, studying hard for a test), one cannot assume that the underlying motivation is the same. Student A may work hard because he or she is driven by approach motivation (i.e., his hope of success is greater than his fear of failure) while Student B may be driven to work hard because of avoidance motivation (i.e., his fear of failure is greater than his hope of success); engaging in a task is not necessarily indicative of approach motivation. After all, an effective way to avoid failure is to do well. It is important to consider the underlying motivation and the approach-avoidance distinction does just that.

Recognizing that the original conceptualisation of achievement goals failed to account for this approach-avoidance distinction, Elliot and his colleagues argued for and demonstrated the utility of incorporating this distinction in the achievement goal approach (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). Elliot and colleagues returned to the early works of some achievement goal theorists (Dweck & Elliott, 1983 as cited in Elliot & Harackiewicz, 1996; Nicholls, 1984) and adopted their trichotomous model of motivation. This model features an approach-avoidance distinction in performance goal, bearing 3 key constructs – mastery goal, performance-approach goal and performance-avoidance goal. The emphasis was on distinguishing performance-approach – "a performance goal directed toward attaining favourable judgements of competence"– and performance-avoidance – "a performance goal aimed at avoiding unfavourable judgements of competence" – goal constructs (Elliot & Harackiewicz, 1996, pp.461). Approach and avoidance motivation were identified as the underlying "motive dispositions…posited to energize, select, and direct achievement behaviour" (Elliot & Church, 1997, pp. 219). The two goal orientations, mastery

and performance, were viewed as "servants of their higher order achievement relevant motives" (Elliot & Church, 1997, pp. 219). That is to say, the primary effect of approach motivation and avoidance motivation on academic behaviour is indirect, mediated by goal orientations. Many studies attest to the robustness of this model in academic and sporting settings, and in North American, European and Asian student populations (e.g., Bong, 2005; Church, Elliot & Gable, 2001; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot, McGregor & Gable, 1999; Pekrun, Elliot & Maier, 2006; Shih, 2005; Skaalvik, 1997).

The implicit assumption that "mastery goals represent an approach form of regulation" (Elliot & McGregor, 2001, pp.502) was later questioned when Elliot and McGregor (2001) considered the possibility of a mastery-avoidance goal construct. A new framework was introduced, fully incorporating the approach-avoidance distinction with the initial 2 achievement goals. This 2 X 2 framework posits four key constructs in the study of motivation – mastery-approach goal, mastery-avoidance goal, performance-approach goal and performance-avoidance goal. The mastery-approach and mastery-avoidance goal constructs are differentiated by the valence of competence; whether an individual is said to possess mastery-approach or mastery-avoidance goals is dependent on one's sensitivity towards the success or failure of developing competence. The 2 X 2 framework has found empirical support in the academic and sporting context, and researchers have begun to shift their focus to this new framework and have found better data fit for this model than the trichotomous framework (Conroy & Elliot, 2004; Cury, et al., 2006; Elliot & McGregor, 2001; Wang, Biddle & Elliot, 2007).

At this point, it is important to note that there is a difference between *avoidant motivation* as captured by the trichotomous model and 2 X 2 framework, and *non-engagement* in a task. Students who avoid failure by not engaging in the task altogether are described as possessing work-avoidant goals (Wigfield et al., 2006). Though both stem from

a desire to avoid failure, the expressed behaviour is different. Avoidant goals (i.e., mastery-avoidance and performance-avoidance) manifests as task-engagement while work-avoidant goals is observed as non-engagement in a task. The present study is careful not to disregard the possibility of Singaporean students possessing work-avoidant goals, but the author persists in the view put forward in Cho & Sim (2008): "Given Singapore's strong emphasis on and practice of meritocracy (which includes its education system), few students in Singapore, if any, would choose to (or can actually) disengage from academic task as a means to avoid failure." For purposes of this research, students are therefore assumed to engage in the task set before them as they would be penalised academically and socially for non-engagement.

In order to avoid any confusion due to terminology, this research adopted two other terms in place of approach and avoidance motivation. Achievement motivation (a term synonymous with hope of success, but presently the more commonly used of the two) was used to refer to approach motivation while fear of failure was used to refer to avoidance motivation. This set of terms also clearly indicates to readers which of the two underlying motive dispositions is greater and therefore driving behaviour.

In a separate study, Salili and Lai (2003) introduced a new goal that has implications on the dichotomous goal dimension. They were interested in how medium of instruction and ability grouping of schools affected students' learning and achievement orientation. One of the variables they examined was goal orientation which included the typical mastery and performance goals. In addition, they included a new "surface goal", defined as "the goal of just passing exams without in-depth understanding or making much effort" (Salili & Lai, 2003, pp. 54). Though the inclusion of this additional goal orientation made sense, there was no empirical testing of its actual existence in the study.

Cho and Sim (2008) introduced this new surface goal to the Elliot and McGregor (2001) 2 X 2 framework, seeking to validate the existence of surface goals and empirically verify the proposed 2 X 3 framework in the Singaporean undergraduate and secondary school populations. The 2 X 3 framework comprises the underlying disposition dimension – achievement motivation and fear of failure – and the achievement goal dimension – mastery, performance and surface goals. Drawing on existing measures of mastery and performance from Elliot and colleagues (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot, McGregor & Gable, 1999) and, Salili and Lai's (2003) surface goal items, Cho and Sim (2008) developed a goal orientation scale for the Singapore context. They found empirical support for the existence of surface goals in two studies sampling undergraduates and secondary school students. Three factors were extracted from the exploratory factor analysis conducted; the factors were identified as the typical mastery and performance goal, and the newly introduced surface goal. However, the distinction between achievement motivation and fear of failure was not apparent. Surface goal was subsequently found to be nomologically distinct from mastery and performance goals; the 3 goals were differentially related to academic performance, worry, depth of processing, competence expectancies and academic self-esteem. To date, only two studies (Cho, 2008; Cho & Sim, 2008) have been known to examine the surface goals in the Singapore context. Hence, it is still premature to draw conclusions regarding the dynamics of this new goal orientation. Findings thus far suggest that surface goal orientation is positively associated with worry, surface processing and disorganisation, and negatively associated with competence expectancies and academic self-esteem. However, further research must be done to verify these associations. Cho and Sim (2008) established that surface goals can be empirically assessed and should be given due consideration in achievement goal research.

Another contribution of Cho and Sim (2008) is the demonstration that achievement motivation and fear of failure may not be distinct constructs (particularly so in the Singapore context). The distinction was consistently absent from all 3 achievement goals examined and this was the case for both the university student and secondary school student samples. This finding could be attributed to the differences in the cultural context. The bulk of research on achievement motivation have been conducted in North American, Canadian or European populations while the study by Cho and Sim was conducted in Singapore – an Asian country and thus expected to be more collectivistic than Western countries. However, evidence from Asian research seems to suggest that culture may not be a sufficient reason. Two Taiwanese (i.e., Asian) studies employed the trichotomous model when examining adolescent academic motivation (Hardre et al., 2006; Shih, 2005). In addition, Shih (2005) concluded that the results "provide empirical evidence to validate the theoretical distinction within performance goals" (pp. 50) (i.e., achievement motivation and fear of failure are distinct types of motivation) and, Wang and colleagues (2007) found that the 2 X 2 framework is applicable to the Singapore secondary school population within the domain of physical education. The latter finding raises questions regarding the results of the abovementioned Singapore study by Cho and Sim (2008). Findings suggest that in the academic context, the differentiation between approach and avoidance motivation is not apparent unlike in the sporting context. Researchers cannot take for granted the validity of the approach-avoidance distinction, particularly in Singapore; more work must be done to determine if the distinction holds true among Singaporean students. In the present study, the 3-factor framework as outlined by Cho and Sim (2008) was preferred because the context was most similar – Singapore undergraduates – and the focus was on the academic arena, where the achievement motivation and fear of failure distinction has not been found.

More recently, Van Yperen (2006) sought to extend previous achievement goal research by studying dominant goals. Though he acknowledged that people may possess a number of achievement goals at the same time, Van Yperen posited that everyone typically has one distinct dominant achievement goal which is more salient in explaining behaviour. Andrew Elliot, a prominent achievement goal researcher, concurred with this view (personal communication, May 13, 2008). Van Yperen was interested in developing a dominant achievement goal measure to allow researchers to gain insight into the individual's dominant goal. A six-item measure was designed; the items were pair-wise comparisons of the 4 goals derived from Elliot and McGregor's (2001) 2 X 2 framework. For example, "In my study, I find it more important… (A) to perform better than "the average" student, or (B) not to perform worse than "the average" student."; this item pairs performance-approach and performance-avoidance goals. Van Yperen conducted two studies, in which participants were asked to select the option they preferred in the round robin, forced-choice measure. If a goal was found to be consistently preferred over the other 3 goals, the participant was considered to possess a dominant achievement goal. If participants did not consistently prefer a particular goal, they were assumed to not have a dominant goal. Van Yperen discovered that it is possible to identify an individual's dominant goal. Using the findings of Cho and Sim (2008) – the 3 factor framework – as a theoretical backbone, Cho (2008) adapted Van Yperen's (2006) dominant goal measure for the Singapore academic context. This adapted measure is described in greater detail later in the report. Results indicated that 96.5% of Singapore undergraduates possess a dominant achievement goal– 64.1% possessed a dominant mastery goal, 26.8% indicated possessing a dominant performance goal and 5.6% indicated having a dominant surface goal (Cho, 2008).

The Present Research

Examining achievement goals is currently one of the more common ways to study motivation. Unfortunately, with so many approaches to making sense of achievement goals, the measures available are just as varied. There is no one measure of achievement goals that is consistently used in existing academic motivation literature. The measures used across research differ according to researcher's affiliations (Elliot & Church, 1997; Skaalvik, 1997). Even within the work of the same researcher, the items used differ across studies (Elliot & Church, 1997; Elliot & McGregor, 2001; Harackiewicz et al., 1997). Table 1 lists some of the studies that examine achievement goals, how the measures were developed and the assessments conducted to determine their psychometric robustness. Though these measures demonstrated good internal reliability and loaded well on the intended factors, there is still a need to ensure that the measures are appropriate for the local academic context.

Existing literature does not offer a measure that stands out as an obvious choice for adaptation to the Singapore context. Moreover, evidence points towards the need to include surface goal orientation in our conceptualisation when examining the local context. Other than Salili and Lai's (2003) study, no other work has incorporated surface goals in the goal orientation measure. This research seeks to develop a reliable and valid achievement goal measure useful for future academic motivation research in the Singapore context. Findings would also add to our limited understanding of achievement goals, particularly surface goals, in the Singapore context.

The present research comprises three studies with the overarching aim of developing a motivation questionnaire. In study 1, participants' responses to a semi-structured interview were used to inform the design of items that capture the three factors. The measure was then revised in study 2 and 3; good items were retained and items that did not capture the intended factors were discarded. All studies were approved by the Institutional Review Board. This

research seeks to develop a questionnaire that is useful for future research, particularly in the

Singapore academic context.

Table 1

List of Studies Examining Goal Orientations and Psychometric Assessments Conducted

Study	Goal orientation examined / Study details	Psychometric Assessments
Elliot & Church, 1997 Participants: psychology undergraduates Context: academic domain, North American	Mastery Performance-approach Performance-avoidance A series of pilot studies were conducted; item pools for each goal were created, tested and revised. Six items were selected to capture each of the 3 goal orientations.	• Exploratory Factor Analysis • Internal consistency (Cronbach's α) • Correlation between goals
Harackiewicz et al., 1997 Participants: psychology undergraduates Context: academic domain, North America	Mastery Performance Work avoidance 15-items were designed to capture the 3 goals.	• Exploratory Factor Analysis • Internal consistency (Cronbach's α) • Correlation between goals • Correlation with other factors – work-mastery, competitiveness, test anxiety, interest, perceived competence and grades
Skaalvik, 1997 Participants: six and eight graders Context: academic domain, Norway	Self-enhancing ego orientation Self-defeating ego orientation Task orientation Avoidance orientation Scales varying from 4 to 7 items were created.	• Exploratory Factor Analysis • Correlation between goals • Correlation with other factors – academic self-concept, self-efficacy, self-esteem and anxiety
Elliot, McGregor & Gable, 1999 Participants: psychology undergraduates Context: academic domain, North America	Mastery Performance-approach Performance-avoidance Used the measure developed by Elliot & Church (1997).	• Internal consistency (Cronbach's α) • Correlation between goals • Correlation with other factors – grades, processing style, exam performance and gender
Elliot & McGregor, 1999 Participants: psychology undergraduates Context: academic domain, North America	Mastery Performance-approach Performance-avoidance Used the measure developed by Elliot & Church (1997).	• Internal consistency (Cronbach's α) • Correlation between goals • Correlations with other factors – test anxiety, emotionality and exam performance
Elliot & McGregor, 2001 Participants: psychology undergraduates Context: academic domain, North America	Mastery-approach Mastery-avoidance Performance-approach Performance-avoidance A new questionnaire was devised to assess the four goals.	• Exploratory Factor Analysis • Internal consistency (Cronbach's α) • Correlation between goals • Correlation with other factors – need for achievement, workmastery, competitiveness, fear of failure, self-determination, perceived class engagement, processing style, test anxiety, worry and emotionality
Salili & Lai, 2003 Participants: seven graders Context: academic domain, Hong Kong	Learning Performance Surface 15 items were designed to capture the three goal orientations	• Internal consistency (Cronbach's α)

Table 1 (cont'd)
List of Studies Examining Goal Orientations and Psychometric Assessments Conducted

Study	Goal orientation examined / Study details	Psychometric Assessments
Shih, 2005 Participants: six graders Context: academic domain, Taiwan	Mastery Performance-approach Performance-avoidance Adapted Elliot & Church's (1997) achievement goal measure.	• Exploratory Factor Analysis • Internal consistency (Cronbach's α) • Correlation between goals • Correlation with other factors – intrinsic motivation, self-handicapping, cognitive strategies and grade.
Hardre et al., 2006 Participants: high school students Context: academic domain, Taiwan	Learning Performance-approach Performance-avoidance Future goals "The Approaches to Learning scale was used to assess four types of student achievement goals" (pp. 194)	• Internal consistency (Cronbach's α) • Correlation with other factors – perceived ability, need for cognition, teacher support and peer support
Wang et al., 2007 Participants: secondary school students Context: sporting domain, Singapore	Mastery-approach Mastery-avoidance Performance-approach Performance-avoidance The original 12-item questionnaire developed by Elliot & McGregor (2001) was used with minor adaptations.	• Confirmatory Factor Analysis • Internal consistency (Cronbach's α) • Correlation between goals • Correlation with other factors – amotivation, perceived competence, enjoyment, effort, boredom

Study 1

The primary aim of study 1 was to construct good items that capture the three types of achievement goal orientations. In addition, this study sought to (1) examine whether a single individual can have different dominant goal orientations across different subjects, and (2) determine how accurate the dominant goal measure is in identifying the dominant goal orientation of Singaporean adolescents. This would help better our understanding of how goal orientations play out. A secondary objective of this study was to examine the achievement motivation and fear of failure distinction within the Singaporean academic context.

Method

Participants

Sixty-two undergraduates participated in study 1. After Part 1 of the study, three participants withdrew their participation so the data collected was discarded. Information provided by 8 other participants was also removed from the data set because they

demonstrated limited understanding during Part 2. The following report is based on the analysis of information provided by 51 participants. All participants were enrolled in either the introductory psychology module or a statistics module offered by the psychology department at the National University of Singapore (NUS). They participated in the study in exchange for 1 credit point which went toward fulfilling module requirements. Of the participants, 90.2% were Chinese, 5.9% were Malay, 2.0% were Indian, and 2.0% were of other ethnicity; 76.5% of the sample were female. All participants were between the ages of 19 and 25 years, with a mean age of 20.5 years. The sample comprised freshmen (78.4%), second year (11.8%) and third year (7.8%) students.

Procedure

In Part 1, participants were asked to complete a survey comprising of two identical sets of questions. The first set was with reference to their study of psychology, and the other was with reference to their study of a non-psychology module they were taking. Each set of questions included a dominant goal scale, to determine the participant's dominant goal orientation in the subject of interest, and 1 question assessing his perceived dominant goal in that same subject. The survey also included questions that elicited information about participants' demographic details. All participants completed the entire questionnaire in one sitting. Only the researcher was present for the duration of the survey, and participants were assured that their responses would remain confidential. At the start and end of the survey, participants were reminded that they had to return at a different timing to continue with Part 2 of the study.

In Part 2, participants were involved in a semi-structured interview. They met with the researcher in a room conducive for an interview. At the end of Part 1, participants were asked if the interview could be audio-taped so that the accuracy of information recorded was not dependent on the memory or the writing speed of the researcher. Eight participants did not

agree to be audio-taped so the help of a research assistant was enlisted to record the responses by hand. Before the interview began, participants were informed that their responses would be kept confidential. Only the researcher, and in some cases a research assistant, was present throughout.

This interview comprised 3 sections (refer to appendix A). The first section was concerned with clarifying the participant's understanding of the 3 goal orientations and determining their dominant goal for their study of psychology and the non-psychology subject. Participants were asked to describe their study behaviour and explain the reason behind their responses to the perceived dominant achievement goal measure that was completed in Part 1 of this study (sample questions: "In the questionnaire, you indicated that you possess mastery goal orientation in your study of psychology. What do you observe in your study behaviour that leads you to think that this is the case?" and "Which is more of a priority to you, understanding the material or doing better than others?"). The interviewer then rated their dominant goal orientation for psychology and the non-psychology subject. This rating later served as a check for the accuracy of the dominant achievement goal measure and the perceived dominant achievement goal question. Participants were also assigned to one of three expert groups – mastery goal expert, performance goal expert and surface goal expert. The expert group assignment was based on the interviewer's assessment of how much insight participants had about the goal orientation they possessed. If participants were rated as possessing the same dominant goal orientation for both subjects, they were automatically assigned to the corresponding expert group. If participants were rated as possessing different dominant goal orientations, they were identified as experts of the goal they demonstrated more insight. This insight could be due to reasons such as interest in the subject and importance of subject. After participants were assigned to expert groups, they were asked to complete a questionnaire. This is section 2 of the interview. Participants were

asked to complete one of three questionnaires – mastery goal, performance goal or surface goal – according to the expert group they were assigned to. Participants rated how representative the questionnaire items were of the goal of interest (refer to *measures* for a more detailed description of this questionnaire). They were then asked to critique the items in the questionnaires (sample items: "Which items are unhelpful in capturing the goal of interest?" and "Are there any ambiguous items?"). A list of questions was drafted prior to the semi-structured interview and the researcher used this as a guide. The last section focused on examining the achievement motivation and fear of failure distinction. Participants were asked to consider their academic behaviour as a whole and based on past experiences, determine if they observe two distinct motivations at work within themselves or among friends. Additional questions were asked during the interview to clarify or probe a comment the participant made.

Measures

    Dominant Achievement Goal. This is a 3-item measure designed by Cho (2008) to identify an individual's dominant goal. It was adapted from Van Yperen's (2006) dominant achievement goal measure. The design is based on the 3-factor model found in the research study conducted by Cho and Sim (2008). As mentioned previously, this is the preferred framework for the current research because the population of interest most closely resembles the sample in Cho and Sim's (2008) study – Singapore undergraduates in an academic context. Participants completed a round robin, forced-choice measure. Each achievement goal (i.e., mastery, performance and surface goal) was contrasted in a pairwise fashion with the other 2 achievement goals. "If a particular achievement goal is consistently preferred by the participant, that is, if it chosen in each of the *two* contrasts between it and another achievement goal, then it is considered to be the individual's dominant goal. If participants do not consistently prefer a particular goal (because they do not have one or because they

respond…randomly or carelessly), it is assumed that they do not have a dominant achievement goal." (Van Yperen, 2006, pp. 1434). With this measure, participants indicated their dominant goal orientation in their study of psychology and one other non-psychology module.

Perceived Dominant Achievement Goal. Participants were presented with the descriptions of the three types of goals (refer to Table 2) – Mastery, Performance and Surface – and were asked, "Which type of goal orientation do you think you possess…?" for psychology and for one non-psychology module.

Table 2
Descriptions of Goal Orientations

Goal Orientation	Descriptions
Mastery	seen in an individual who seeks to develop competence; he or she works to gain mastery in the subject.
Performance	seen in an individual who seeks to demonstrate that he is competent; he or she works to match or better the standards of peers, or meet the expectations of parents/teachers.
Surface	seen in an individual who seeks to pass; he or she works to meet the minimum standard, enough to move up to the next level.

Mastery goal questionnaire. This questionnaire consisted of 18 items (sample item: "My goal for this subject is to learn as much as possible."). It is a combination of items from Cho and Sim's (2008) study, and new items designed to capture the theoretical conceptualization of mastery goal. Participants were asked to indicate how representative each statement is of mastery goal on a 4-point scale – *not at all*, *to a very limited extent*, *quite representative*, *very representative*. Recognizing that the achievement goal one possesses is domain-specific, all items were phrased with reference to the participants' study of either psychology or a non-psychology module. The mean rating of each item was tabulated to determine how well the items captured mastery goal orientation.

Performance goal questionnaire. This questionnaire consisted of 19 items (sample item: "My goal for this subject is to get a better grade/mark than my classmates."). It is a combination of items from Cho and Sim's (2008) study, and new items designed to capture

the theoretical conceptualization of performance goal. Participants were asked to indicate how representative each statement is of performance goal (1 to 4). Items were phrased with reference to the participants' study of either psychology or a non-psychology module. A mean rating of each item was tabulated.

Surface goal questionnaire. This questionnaire consisted of 22 items (sample item: "My goal for this subject is to just pass."). It is a combination of items from Cho and Sim's (2008) study, and new items designed to capture the theoretical conceptualization of surface goal. Participants were asked to indicate how representative each statement is of the intended goal (1 to 4). Items were phrased with reference to the participants' study of either psychology or a non-psychology module. A mean rating of each item was tabulated.

Results and Discussion

At the start of every interview, participants were asked to describe their academic behaviour and to explain their responses to the dominant achievement goal measure and the perceived dominant goal achievement measure. All participants acknowledged (during the interview) having a dominant achievement goal orientation in their study of psychology. Based on their responses, the interviewer placed them into one of three dominant goal orientation groups; 20 participants (39.2%) possessed a dominant mastery goal orientation, 24 (47.1%) had a dominant performance goal orientation and 7 participants (13.7%) indicated having a dominant surface goal orientation in their study of psychology. Among the 51 participants, 56.9% indicated having a different dominant goal in the non-psychology module. This suggests that individuals can have different goal orientations across different subjects. This non-psychology module could be a module from any faculty, within their major or otherwise. The only instruction given to participants was "Think of one non-psychology module you are taking this semester…". As such, the non-psychology module participants had in mind while answering the questionnaire, varied widely across individuals. Thirty-two

participants chose Arts and Social Science modules, 13 chose Science modules, 2 participants had in mind Business modules, and 1 Medicine, 1 Computing and 1 writing module was used as reference. Given the variation in module types, any pattern in the dominant goal orientation of non-psychology module would not be meaningful. Thus the breakdown of dominant goal orientation for the study of non-psychology modules was not obtained. In this study, of the 102 responses (51 responses with reference to the study of psychology and 51 responses with reference to a non-psychology module), 37.3% endorsed a dominant mastery goal orientation, 41.2% indicated a dominant performance goal orientation, and 21.6% endorsed a dominant surface goal orientation.

Participants' responses to the dominant achievement goal measure and the perceived dominant achievement goal question were compared with their responses during the interview (i.e., interviewer rating) to determine the accuracy of the former two measures. From the 102 responses obtained on the dominant achievement goal measure (each participant responded twice; once for each module), the findings accurately identified the dominant goal in 77.5% of the cases. When responses were limited to the domain of psychology, this 3-item measure accurately identified the dominant goal in 72.5% of the cases. The second comparison (i.e., between perceived dominant achievement goal question and interview response) showed that overall, the single question was more accurate (92.2%) in identifying the dominant achievement goal. Only 8 participants were not able to correctly identify their dominant goal orientation; six of these participants were unable to discern the differences between mastery and performance goals, thus responded to the perceived dominant achievement goal measure wrongly. When the subject of interest was psychology, the perceived dominant goal orientation single-item measure correctly identified 90.2% of the cases. A two-way contingency table analysis was conducted to evaluate how much agreement there is between the 3-item measure and the single question measure. Results indicate that the

two measures are significantly associated with each other, *phi* = .995, *p* < .001. The results suggest that the single-item measure was more accurate than the round robin 3-item measure in identifying the dominant achievement goal orientation, within the domain of psychology and otherwise. However, there is significant agreement between the two measures. Another advantage of the single item is that it is more straight-forward and would be much simpler to administer and compute. But the three-item measure would be more suitable for a study which requires that participants be kept from knowing what the three goal types are.

Seventeen participants were asked to rate how representative the items in the mastery goal orientation measure are. The mean rating of each item in the mastery goal orientation questionnaire was tabulated. One sample t-test was conducted to determine if the mean ratings are significantly different from a rating of 2 (i.e., representative to a limited extent). Results indicated that the average ratings of all the mastery goal items were significantly different from a rating of 2 (refer to Table 3). That is to say, statistically, all the items were relatively good items; they were rated more than just *representative to a limited extent*.

Content analysis revealed that though all the items were deemed statistically sound, some items were not appropriate in capturing mastery goal orientation. Participants made a clear distinction between not understanding and forgetting, stating that mastery goal is related to the former. An individual can have mastery of a subject and still experience the natural process of forgetting that occurs with time. When asked what the opposite of gaining mastery is, one participant concisely explained it as "the inability to understand despite having been taught". With this insight, all items that contained the notion of forgetting were considered to be unhelpful in capturing mastery goals – "My goal in this subject is to not forget any of the material I have learnt", "I study hard for this subject so that I will not forget what I have been taught.", "For this subject I feel most successful when I do not forget all that I have learnt." and " It is most important for me to not forget what I have been taught in this subject, even if

it is no longer going to be tested.". The item, "I feel most happy when I do not make careless mistakes" had the lowest average rating; the least representative statement. Participants explained that not wanting to make careless mistakes is not unique to individuals with mastery goals. An individual endorsing the statement "I feel most happy when I do not make careless mistakes." is not more likely to possess mastery goal orientation. As this statement does not capture mastery goal orientation, it was also removed. In all, 5 items were discarded.

Table 3
One Sample t-test Examining Representativeness of Mastery Goal Items (Study 1)

Item	Mean Rating	Test value = 2	
		t (df = 16)	*p*
My goal for this subject is to learn as much as possible.	3.71	14.98	< .001
Understanding everything that is taught in this subject is more important than getting higher marks than my classmates.	3.71	14.98	< .001
I feel most happy when I learn something new in this subject.	3.65	13.79	< .001
It is most important for me to understand thoroughly whatever I am taught in this subject.	3.65	13.79	< .001
I study hard for this subject so that I will have a good grasp of the subject.	3.53	12.26	< .001
I work hard because I enjoy this subject.	3.53	10.10	< .001
For this subject, I feel most successful when I understand all the topics.	3.53	8.79	< .001
If I do not understand a topic in this subject, I will ask my teachers/friends to explain until I understand fully, before studying it.	3.47	9.71	< .001
I enjoy studying this subject because I get to learn new things.	3.41	8.17	< .001
For this subject, I sometimes revise what I have learnt previously even though it is not going to be tested.	3.35	6.47	< .001
It is most important for me to not forget what I have been taught in this subject, even if it is no longer going to be tested.	3.35	7.95	< .001
I study hard for this subject so that I will not forget what I have been taught.	3.29	6.29	< .001
I enjoy challenging topics even if it is difficult to learn.	3.24	6.13	< .001
For this subject, I enjoy the challenge of difficult assignments because they help me understand the subject better.	3.18	7.63	< .001
My goal for this subject is to not forget any of the material I have learnt.	3.12	5.37	< .001
For this subject I feel most successful when I do not forget all that I have learnt.	3.06	5.28	< .001
For this subject, I think I have failed if I do not learn as much as I can.	3.00	4.76	< .001
I feel most happy when I do not make careless mistakes.	2.71	2.63	.018

Note: Participants were asked to rate items on a 4-point scale: 4 – very representative, 3 – quite representative, 2 – to a limited extent, 1 – not at all.

Through the course of the interview, two behaviours were mentioned as uniquely associated with mastery goals but were not captured in any of the items. Participants pointed out that they read up on the subject during their free time. Also, some indicated that they sometimes worked hard because they were afraid that they may not understand certain topics despite having been taught. So they spend time on the subject to ensure that they are not incompetent. This is different from performance goal because the focus is not on demonstrating competence but on developing competence. Their frustration comes from not being able to master the subject despite having put in effort, unlike in the case of individuals with performance goals whose sights are set on doing better than others. Some additional items were created to capture the abovementioned behaviours. Table 4 features the items in the revised mastery goal orientation measure.

Table 4
Revised Mastery Goal Orientation Measure (Study 1)

My goal for this subject is to learn as much as possible.

Understanding everything that is taught in this subject is more important than getting higher marks than my friends.

I feel most happy when I learn something new in this subject.

It is most important for me to understand thoroughly whatever I am taught in this subject.

I study hard for this subject so that I will have a good grasp of the subject.

I work hard because I enjoy this subject.

For this subject, I feel most successful when I understand all the topics.

If I do not understand a topic in this subject, I will ask my teachers/friends to explain until I understand fully, before studying it.

I enjoy studying this subject because I get to learn new things.

For this subject, I sometimes revise what I have learnt previously even though it is not going to be tested.

I enjoy challenging topics even if it is difficult to learn.

For this subject, I enjoy the challenge of difficult assignments because they help me understand the subject better.

For this subject, I think I have failed if I do not learn as much as I can.

I study hard for this subject so that I will not be incompetent. *

I read up on this subject in my free time so that I can better understand this subject. *

I sometimes spend my free time doing extra readings so that I am sure I understand the subject. *

I work hard for this subject so that I am sure I understand the subject. *

I would do supplementary readings in order to better understand this subject. *

Note: * indicates the new items

Nineteen participants were assigned to the performance goal expert group and asked to rate how representative the items in the performance goal orientation measure are of the

goal of interest. The mean ratings of each item in the performance goal orientation questionnaire were examined to determine if they were significantly different from a rating of 2 (i.e., representative to a limited extent). Results of the one sample t-test indicated that the average ratings of all the performance goal items were significantly different from a rating of 2 (refer to Table 5) with the exception of one item. The average rating of "For this subject, I enjoy the challenge of difficult assignments because it shows how much better I am than my classmates." was not significantly different from a rating of 2, $t(df = 18) = 1.68$, $p = .11$. This item was deemed to be not a good item and was removed.

Participants distinguished between wanting to do better than others, and showing that they are better than others. It seems that an individual with performance goal would seek to demonstrate one's competence but not necessarily seek to "show off". Their desire to demonstrate competence is restricted to proving to themselves or parents that they have the ability to do well. They seek to do better than friends because it indicates aptitude and ability in the field. This in turn leads to feelings of security, happiness and satisfaction. This finding highlights the need to examine underlying motives so that we are able to better capture performance goals. Items that were related to "showing off" to others were either removed or rephrased. "For this subject, I enjoy the challenge of difficult assignments because it shows how much better I am than my classmates." as mentioned above, was removed. "I work hard because I want to show that I am good in this subject." and "I enjoy studying this subject because I get to demonstrate how good I am." were rephrased to incorporate the idea of demonstrating competence to oneself rather than to others. The two items were reworded to read "I work hard because I want to demonstrate to myself that I am good in this subject" and "I enjoy studying this subject because I get to demonstrate how good I am to myself." respectively.

Table 5
One Sample t-test Examining Representativeness of Performance Goal Items (Study 1)

Item	Average Rating	Test value = 2	
		t (df = 18)	*p*
I feel most happy when my grade/mark for this subject is higher than that of my friends.	3.42	8.95	< .001
I study hard for this subject so that I can do better than others in tests/exams.	3.37	12.04	< .001
My goal for this subject is to get a better grade/mark than my classmates.	3.37	8.72	< .001
It is most important for me to perform better than my classmates in this subject.	3.37	9.99	< .001
I study hard for this subject so that I will not get poorer results than my friends.	3.37	8.72	< .001
I feel most happy when my grade/mark for this subject is not lower than that of my friends.	3.26	9.80	< .001
My goal for this subject is not to fare worse than my classmates.	3.26	8.43	< .001
For this subject, I feel most successful when I score better than my classmates.	3.21	7.40	< .001
Getting higher marks than my classmates in this subject is more important than understanding everything that is taught.	3.21	7.40	< .001
If I do not understand a topic in this subject, I will just memorize it anyway in order to score in the tests/exams.	3.16	6.60	< .001
It is most important for me not to fall behind my classmates in this subject.	3.16	6.60	< .001
For this subject, I just want to avoid getting lower grades/marks than my friends.	3.11	7.32	< .001
I work hard because I want to show that I am good in this subject.	3.05	6.51	< .001
For this subject, I feel most successful when I do not fare worse than my classmates.	3.05	5.88	< .001
Even when I score very well in the tests/exams for this subject, I feel sad if the grade/mark is lower than what my classmates got.	2.68	3.64	.002
I enjoy studying this subject because I get to demonstrate how good I am.	2.63	3.31	.004
For this subject, I think I have failed if I do not score as well as my friends.	2.63	3.31	.014
I want to do well in this subject so that others will not think that I am a weak student.	2.63	2.72	.004
For this subject, I enjoy the challenge of difficult assignments because it shows how much better I am than my classmates.	2.37	1.68	.110

Note: Participants were asked to rate items on a 4-point scale: 4 – very representative, 3 – quite representative, 2 – to a limited extent, 1 – not at all.

In designing the performance goal questionnaire, it was assumed that "friends" and classmates" would be interpreted as the same group of people – peers who are studying the same module and serve as a point of reference for how well one is doing academically. However, during the interview, many participants pointed out that the two terms refer to different groups of peers. "Friends" represent people with whom an individual associates

with and friends may or may not be taking the same module. "Classmates", on the other hand, refer to a relationally more distant group of peers who are studying the same module, and for some participants, this term is limited to the peers who are in the same tutorial group. Comparisons are usually made with friends because one would know their abilities better, allowing more meaningful comparisons. Though classmates do affect how well one does in a bell-curve grading system, the superficial relationship they share renders classmates less significant to the individual. As a result, participants were less concerned with demonstrating competence in relation to their classmates. This finding suggests that it would be more meaningful to use the term "friends" in the questionnaire. However, a drawback is that some individuals may be taking the module of interest unaccompanied and would not have friends to compare with. Other alternatives were explored. The term "others" cues the participant as to what the point of reference is, without limiting it to a specific group of peers. But it is ambiguous, and may cause unnecessary confusion to participants. "Friends or classmates" allows participants to decide which group of peers is their point of reference in the study of interest. The imperative of performance goals is that the individual seeks to demonstrate competence. Who the point of reference is and what category of peers they fall under is of little significance as long as the individual actually makes that comparison. The use of "friends or classmates" acknowledges that there is a difference between the two terms and asks participants to respond to the item according to their own unique experience. Given the comprehensive nature of this term, it was preferred over the other three. In order to prevent confusion, the term "friends" was used in the amended items as it is the more natural point of comparison. But in the instructions, participants were told that those who did not have friends taking the same module should make reference to their classmates. The edited performance goal items can be seen in Table 6. Some mastery and surface goal items also made reference to peers. These items were also edited accordingly (see Table 4 and 8).

It was interesting to note that many participants were quick to point out that enjoying the subject is not associated with performance goals at all. Participants mentioned that they do not necessarily enjoy the subject but they still try to perform. "I enjoy studying this subject because I get to demonstrate how good I am." also had relatively lower average ratings compared to the other performance goal items. This item was dropped from the list.

Table 6
Revised Performance Goal Orientation Measure (Study 1)

I feel most happy when my grade/mark for this subject is higher than that of my friends.

I study hard for this subject so that I can do better than my friends in tests/exams.

My goal for this subject is to get a better grade/mark than my friends.

It is most important for me to perform better than my friends in this subject.

I study hard for this subject so that I will not get poorer results than my friends.

I feel most happy when my grade/mark for this subject is not lower than that of my friends.

My goal for this subject is not to fare worse than my friends.

For this subject, I feel most successful when I score better than my friends.

Getting higher marks than my friends in this subject is more important than understanding everything that is taught.

If I do not understand a topic in this subject, I will just memorize it anyway in order to score in the tests/exams.

It is most important for me not to fall behind my friends in this subject.

For this subject, I just want to avoid getting lower grades/marks than my friends.

I work hard because I want to demonstrate to myself that I am good in this subject

For this subject, I feel most successful when I do not fare worse than my friends.

Even when I score very well in the tests/exams for this subject, I feel sad if the grade/mark is lower than what my friends got.

For this subject, I think I have failed if I do not score as well as my friends.

I want to do well in this subject so that my friends and parents will not think that I am a weak student.

I study hard for this subject so that I can meet or exceed my parents' expectations.*

My goal for this subject is to meet or exceed my parents' expectations.*

For this subject, I feel most successful when I meet or exceed my parents' expectations.*

It is most important for me to meet or exceed my parents' expectations in this subject.*

Note: Instructions for this set of items included, 'If you do not have friends taking this module with you, replace the term "friends" with "classmates".'
* indicates the new items.

One perspective that was not captured in the questionnaire was that of parents' expectations. According to the definition, an individual with performance goals uses the standard of others as a point of reference. With peers, the individual seeks to demonstrate his competence by matching or doing better than them. With parents, the individual seeks to demonstrate competence by meeting or exceeding their expectations. All the items in the questionnaire revolve around the standard of peers, making no attempt to account for the

expectations of significant others. Participants agreed that there was a need for items that address the expectations of parents. In the academic context, significant others typically include teachers. However, given the cultural norms of the university population, it is assumed that the expectations of teachers are less significant to a student. The role of teaching staff in the university is to primarily impart knowledge. They do not micro-monitor the performance of students and usually encourage independent learning. Therefore the expectation of teachers was not deemed to be an important addition. A few items were added to account for parents' expectations. Table 6 lists the items in the revised performance goal orientation measure.

Fifteen of the participants rated how representative the items in the surface goal orientation measure are of the goal of interest. The average rating of each item in the surface goal orientation questionnaire was tabulated. One sample t-test was conducted to determine if the average ratings were significantly different from a rating of 2 (i.e., representative to a limited extent). Table 7 displays the items and the results of the one sample t-test.

Among the items in the list, "I work hard because I want to pass" had a relatively low average rating. Participants took issue with the phrase "work hard" stating that even though individuals with surface goals want to pass, they do not necessarily work hard. One participant added that if an individual has adequate aptitude for the subject, there is no need to work hard at all. Interestingly, items such as "My goal for this subject is to not fail." and "My goal for this subject is just to pass." had relatively high average ratings. These items are all similarly phrased but based on participant responses, it is apparent that having a goal does not necessarily mean that the individual has to work hard to achieve it. This suggests that surface goals are usually well within the capabilities of an individual and it is not for lack of ability that a student adopts surface goal orientation. It is a choice one makes, possibly to free up limited resources to better attend to other subjects.

Table 7

One Sample t-test Examining Representativeness of Surface Goal Items (Study 1)

Item	Average Rating	Test value = 2	
		$t\ (df = 14)$	p
Scoring an A for this subject would be nice, but passing is enough for me.	3.80	16.84	< .001
It is most important for me not to fail this subject.	3.80	16.84	< .001
It is most important for me to pass this subject.	3.67	13.23	< .001
As long as I pass, it doesn't matter that my friends do better than me.	3.60	12.22	< .001
My goal for this subject is not to fail.	3.60	9.80	< .001
My goal for this subject is to just pass.	3.53	9.28	< .001
Passing this subject more important than getting higher marks than my classmates.	3.47	8.88	< .001
I study just enough so that I will not fail the tests/exams.	3.47	8.88	< .001
I feel most happy when I do not fail this subject.	3.47	7.64	< .001
For this subject, I do not enjoy difficult assignments because I am less likely to pass.	3.40	7.36	< .001
I just want to pass this subject.	3.40	7.36	< .001
I aim to achieve just the minimum requirements for this subject so that I can move on to the next level.	3.40	7.36	< .001
Scoring an A grade for this subject would be nice, but not failing is enough for me.	3.40	8.57	< .001
For this subject, I do not mind falling behind my classmates as long as I do not fail.	3.40	8.57	< .001
I study just enough so that I can pass the tests/exams.	3.33	8.37	< .001
I feel most happy when I pass this subject.	3.27	6.14	< .001
For this subject, I feel most successful when I do not fail.	3.27	6.97	< .001
As long as I do not fail in this subject, I won't regard myself as a failure.	3.27	6.97	< .001
I would rather study just enough to pass the tests/exams in this subject than cover the entire syllabus.	3.07	4.30	.001
I work hard because I want to pass.	2.93	4.09	.001
For this subject, I feel most successful when I pass.	2.87	4.52	< .001
If I do not understand a topic in this subject, I will skip it as long as I think I can still pass the tests/exams.	2.73	2.96	.010

Note: Participants were asked to rate items on a 4-point scale: 4 – very representative, 3 – quite representative, 2 – to a limited extent, 1 – not at all.

One criticism participants had was that some items were exactly the same and did not serve any additional purpose. "I study just enough so that I can pass the tests/exams" and "I study just enough so that I will not fail the tests/exams.", and "Scoring an A for this subject would be nice, but passing is enough for me." and "Scoring an A grade for this subject would be nice, but not failing is enough for me." were the two pairs identified. Within each pair, the item that had the lower average rating was discarded. The intention of differentiating between passing and not failing was to capture the achievement motivation and fear of failure

distinction among participants. An individual who has achievement motivation was expected to endorse the first item of each pair while an individual with fear of failure was expected to endorse the second item in each pairing because the former is oriented towards the possibility of reaching their goal while the latter is orientated towards the possibility of not reaching their goal. The results suggest that "pass" and "not failing" are exactly the same and are not helpful in differentiating the two types of motivations. Since they were capturing the exact same thing, only one item of each pair was retained. Interestingly, very few participants felt that the following two pairs overlapped – "It is most important for me to pass this subject." and "It is most important for me not to fail this subject", and "I feel most happy when I pass this subject." and "I feel most happy when I do not fail this subject.". Unfortunately participants were not able to explain why these two pairs were not perceived as overlapping. Future research could pursue this further, examining the concepts "pass" and "fail". This would benefit the development of items that accurately capture surface goals.

Some participants commented on the use of terms – "pass" and "not failing". They felt that the terms implied 50% of the total marks one can possible get. This was despite having provided participants with the definition of surface goals as seeking to achieve the minimum grade required to move on to the next level. This may be because in the earlier years of education (primary and secondary school), pass is usually associated with an absolute 50 out of 100 marks. In Singapore tertiary education, students are graded on a bell curve. A grade of 65 marks may be decent in a module where most students are achieving less than 60 marks but a lousy grade in another module where majority of students are getting more than 70 marks. The marks necessary to get to the next level varies across classes, depending on the performance of other students. As such, participants suggested that the term "minimum standard" be used instead of "pass" or "not failing". However, this switch may introduce new ambiguity. The suggested term may be interpreted as the minimum standard

that an individual seeks to achieve. For instance, "My goal for this subject is to meet the

minimum standard." This statement could be understood as one wanting to achieve a B grade

in the module because that is the minimum standard that he or she has set. This problem arose

during some interviews because some participants indicated that they possess surface goals

but when asked what the minimum standard to get to the next level is, a few placed the

standard at B grade to A- grade. The reason they gave for identifying with surface goal

orientation rather than performance goal orientation was that this was a standard they set for

themselves, regardless of the performance of others. This problem may be exacerbated if the

term "minimum standard" was used instead. As such, the original terms were retained but an

additional note indicating that, for the surface goal orientation items, "pass" refers to the

minimum standard required in that module to move on to the next level was included.

Table 8
Revised Surface Goal Orientation Measure (Study1)

Scoring an A for this subject would be nice, but passing is enough for me.
It is most important for me not to fail this subject.
It is most important for me to pass this subject.
As long as I pass, it doesn't matter that my friends do better than me.
My goal for this subject is not to fail.
Passing this subject more important than getting higher marks than my friends.
I study just enough so that I will not fail the tests/exams.
I feel most happy when I do not fail this subject.
For this subject, I do not enjoy difficult assignments because I am less likely to pass.
I just want to pass this subject.
I aim to achieve just the minimum requirements for this subject so that I can move on to the next level.
For this subject, I do not mind falling behind my friends as long as I do not fail.
I study just enough so that I can pass the tests/exams.
I feel most happy when I pass this subject.
For this subject, I feel most successful when I do not fail.
As long as I do not fail in this subject, I won't regard myself as a failure.
I would rather study just enough to pass the tests/exams in this subject than cover the entire syllabus.
For this subject, I feel most successful when I pass.
If I do not understand a topic in this subject, I will skip it as long as I think I can still pass the tests/exams.
This subject is not a priority to me.*

Note: Instructions for this set of items included, " 'pass' refers to the minimum standard required in the module to move on to the next level.
* indicates the new items.

Participants also suggested including items that captured other behaviours related to surface goal orientation such as the willingness to skip lectures and whether the module is a priority. Both items shed light on how important the module is to a student. However, one's willingness to skip lecture may also be due to other lecture-related factors such as the effectiveness of the lecturer, the timing of the class, etc. Therefore only one additional item was included in the surface goal orientation questionnaire. Table 8 lists the items in the revised performance goal orientation measure.

Out of the 51 participants interviewed, 38 (74.5%) could distinguish between achievement motivation and fear of failure in their academic behaviour. But 13 participants (25.5%) did not think that the distinction exists. In particular, a few of these participants could not identify fear of failure in their academic experience at all and so determined that fear of failure does not exist. The majority of participants 66.7% noted that the two motivations are not mutually exclusive and are complementary in their effect. Also, they observed that usually, there is one motivation that is more dominant. Factors such as number of past successes and failures, amount of time left to study, and most recent related academic experience affects which motivation is selected as the dominant motivation for that subject, at that point in time. This suggests that among Singaporean undergraduates, achievement motivation and fear of failure are distinct, though sometimes not immediately obvious to the conscious self. In the 2008 study, Cho and Sim could not find any distinction between achievement motivation and fear of failure among Singaporean adolescents. The findings of the present study offer some explanation for this. The two types of motivations may be indistinguishable because the less dominant motivation works in tandem to reinforce the more dominant motivation. So participants would endorse both motivations in their responses. It is important to note that this non-distinction has been found in a very specific population and so the explanation offered is possibly limited Singapore undergraduates in the academic

context. Taking these into consideration, further analyses was conducted in study 2 to confirm whether the distinction between achievement motivation and fear of failure hold up empirically in the Singapore undergraduate academic context.

The primary aim of study 1 was to develop items that accurately captured mastery goal, performance goal and surface goal orientations. Mean ratings were examined and content analysis was conducted, producing items posited to capture the goal orientations. As this is a newly developed questionnaire, further tests had to be conducted to examine the psychometric properties of this questionnaire and ensure that it is valid and robust in the Singaporean undergraduate academic context. This was the primary objective of studies 2 and 3.

Study 2

Study 2 sought to examine whether the questionnaire developed in study 1 captures the 3 types of goals and to determine which items are good. This study also examined (1) the relationship between the goal orientations and school-related variables and (2) whether there is a systematic pairing between an individual's dominant goal and the goal orientation that he or she scores highest on. The secondary objective was to determine whether the achievement motivation and fear of failure distinction is empirically supported in the Singapore academic context.

The school-related variables in this study are worry, academic self-esteem, processing styles – deep processing, surface processing and disorganisation – and competence expectancies. This selection of variables was made because they are commonly studied in previous studies (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot, McGregor & Gable, 1999; Harackiewicz et al., 1997; Skaalvik, 1997), providing a basis for comparison. Moreover, evidence from past research (Cho & Sim, 2008; Cho, 2008) indicate that the 3 goal orientations have different associations with this set of variables. That is to say, the

nomological network provided by this set of variables can distinguish the 3 goal orientations. Mastery goal orientation has been found to be unrelated to worry while performance and surface goals were positively linked to worry (Cho & Sim, 2008). Academic self-esteem and competence expectancies are positively related to mastery goals and negatively related to surface goals (Cho & Sim, 2008; Skaalvik, 1997). In addition, they are unrelated to performance goals (Cho & Sim, 2008). Deep processing involves "challenging the veracity of information encountered and attempting to integrate new information with prior knowledge and experience" (Elliot, McGregor & Gable, 1999, pp. 549) and surface processing is defined as "repetitive rehearsal and rote memorization of information" (Elliot, McGregor & Gable, 1999, pp. 549). Research has shown that mastery goal is positively related to deep processing (Cho & Sim, 2008; Elliot & McGregor, 2003; Elliot, McGregor & Gable, 1999) while performance and surface goals are unrelated to deep processing. Surface processing, on the other hand, was found to be unrelated with mastery goal but positively related to performance goals (Cho & Sim, 2008; Elliot & McGregor, 2003; Elliot, McGregor & Gable, 1999). Surface goal was also positively associated with surface processing (Cho & Sim, 2008). The third study strategy – disorganisation – refers to "the learner's difficulty in establishing or maintaining a structured, organized approach to studying" (Elliot, McGregor & Gable, 1999, pp. 549). This variable has been positively linked to surface goals but negatively linked to mastery goals. Performance goals were not associated with it (Cho & Sim, 2008; Elliot & McGregor, 2003). The relationship between the three goal orientations and school-related variables in this study were expected to echo past research.

Method

Participants

Two hundred and ninety-five undergraduates participated in study 2. All participants were enrolled in either the introductory psychology module or a statistics module offered by

the psychology department at NUS. They participated in the study in exchange for 1 credit point which went toward fulfilling module requirements. Of the participants, 91.5% were Chinese, 1% were Malay, 4.1% were Indian, and 3.4% were of other ethnicity; 74.9% of the sample were female. All participants were between the ages of 18 and 25 years, with a mean age of 19.89 years. In the sample, 70.2% were freshmen, 16.6% were in the second year of their study, 7.8% were third year students, and the remaining were in Year 4.

Procedure

The achievement goal questionnaire – comprising the revised mastery goal, performance goal and surface goal measures developed in study 1 – were compiled with a worry scale, academic self-esteem scale, processing style measures and questions assessing competence expectancies to form the questionnaire used in the present study. Also included in the questionnaire were a dominant goal scale and demographic items. This questionnaire was administered in one sitting as an online survey. The items in the achievement goal measure are listed in study 1. Only the researcher was present for the duration of the survey. Participants were assured that their responses would be kept confidential.

Measures

Achievement goal measure. This measure consisted of 59 items; 18 items were designed to capture mastery goal, 21 items were designed to capture performance goal and 20 items were designed to capture surface goal (refer to study 1 for the items). Participants were asked to indicate how well each statement described them on a 4-point scale – *does not describe me at all*, *describes me to a limited extent*, *describes me quite well*, *describes me very well*. Recognizing that the achievement goal one possesses is domain-specific, all items were phrased with reference to the participants' study of psychology. Participants responses were later averaged to give 3 mean scores; one score for each type of goal orientation.

Worry. "Prior research has selected worriers primarily on the basis of one question (What percent of the day do you typically worry?)" (Meyer et al., 1990, pp. 487). But it is the view of the current author that an instrument that elicits information on patterns of behaviour and cognition would better capture worry. The worry scale for this research was adapted from the Penn State Worry Questionnaire (PSWQ) developed by Meyer and colleagues (1990). Only items which had higher loadings from the original study (Meyer et al., 1990) and items that were appropriate to the undergraduate context were used (sample item: "I worry about this subject all the time."). In completing this measure, participants indicated their response to each item on a 1 (*does not describe me at all*) to 4 (*describes me very well*) scale. Some items were negatively worded and were recoded so that a higher score reflected higher worry. Participants' responses for all the items were averaged to form a worry composite score. The PSWQ showed good internal consistency in the Meyer et al. original study (α = .94). Reliability analysis in the present study revealed that all items had good corrected item-total correlation (i.e., correlations were greater than .30). In addition, analysis indicated that there would be no significant increase in Cronbach alpha if any of the items were deleted. The worry measure showed good internal consistency (α = .90).

Academic Self-esteem. Chin's (2006) adaptation of the academic subscale of Harter's (1988) Self-Perception Profile for Adolescents was used to assess academic self-esteem. Chin's scale contained 8 items (sample item: I am as smart in this subject as others of the same age as me."). In this study, participants were required to indicate their response on a scale of 1 (*does not describe me at all*) to 4 (*describes me very well*). Negatively worded items were recoded so that a higher score indicated higher academic self-esteem. Responses for the items were averaged to form a mean academic self-esteem score. Reliability analysis demonstrated that all items had good corrected item-total correlation and the measure showed good internal consistency (α = .80)

Processing Styles. Deep processing, surface processing, and disorganisation are three forms of processing styles, also known as study strategies. The measure devised by Elliot, McGregor, and Gable (1999) was used to assess participants' processing styles: (1) Deep processing (sample item: "When the teacher teaches something new, I think about it and decide if it makes sense."), (2) Surface processing (sample item: "When I study for the exam, I try to memorize as much as I can."), and (3) Disorganization (sample item: "I find it difficult to develop a study plan for this subject."). Participants indicated on a scale of 1 (*does not describe me at all*) to 4 (*describes me very well*) how well the items described them. Their responses for each of the study strategies were averaged to give 3 composite scores. Several studies have provided evidence for the internal consistency of these measures (Elliot & McGregor, 2001; Elliot, McGregor, & Gable, 1999). In this present study, though not all the Cronbach alphas were as high, they were all reasonably substantial ($\alpha = .65$, $\alpha = .77$ and $\alpha = .85$ respectively).

Competence Expectancies. A 4-item competence expectancies scale was developed by Harackiewicz and colleagues (1997) and adapted for use in the present study (sample item: "I think I am doing very well in this subject."). Participants were asked to indicate their response to each item on a 1(*does not describe me at all*) to 4 (*describes me very well*) scale. Some items were negatively worded and were subsequently recoded so that a higher score indicated higher competence expectancies. One item (I am worried about my grade in this subject") demonstrated poor corrected item-total correlation and was removed. The scale subsequently showed good internal consistency ($\alpha = .74$). Participants' responses for all the items were averaged up to form a competence expectancy composite score.

Dominant Achievement Goal. This is a 3-item measure designed by Cho (2008) to identify an individual's dominant goal. It was adapted from Van Yperen's (2006) dominant achievement goal measure. The design is described in study 1. This measure was used to

identify participants' dominant goal orientation in their study of psychology. It was preferred over the single item measure introduced in study 1 because participants needed to be kept from being aware of the three types of goals the questionnaire was eliciting. This would prevent participants from rationalizing their responses to the 3 goal measures.

Demographic variables. Participants were asked to indicate their age, gender, ethnicity, family income and year of study.

<div align="center">*Results and Discussion*</div>

Exploratory Factor Analysis

Bartlett's test of sphericity showed that the items were significantly dependent (p < .001), while the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated that the items were fairly homogeneous (KMO = .886). The participant-item rule of thumb ratio of 5:1 was also met. Although Bartlett's test is very sensitive when used on a large sample and KMO is a rule of thumb for homogeneity of sample, these results, when taken together, suggest that it is appropriate to conduct exploratory factor analysis (EFA).

A principal axis factoring analysis with varimax rotation was conducted on the 59 motivational behaviour items to test the validity of the 3 factor model posited in this study. Though previous research has shown that some of the motivational behaviours are significantly correlated, these correlations were moderate to low (Elliot & Church, 1997; Elliot, McGregor, & Gable, 1999; Skaalvik, 1997). Conceptually, the three goal orientations can be seen as more or less mutually exclusive. Therefore, orthogonal (or Varimax) rotation was used for rotational purposes in this study. The analysis yielded 11 factors with eigenvalues exceeding unity while the scree plot indicated that only 3 factors should be extracted. Therefore, only 3 factors were extracted.

Most of the items loaded well on one of the three factors. Items that did not load well on one of the three factors extracted were dropped. Tabachnik and Fidell (2007) recommends

interpreting items that have loadings of .32 or more. This study adopted a slightly more conservative criterion of .40; only items that demonstrated a factor loading of at least .40 on its intended factor (and not on any other factor) were retained. Table 9 displays the factor loadings of the items retained for each of the three factors. Factor 1 accounted for 18.3% of the total variance and comprised 15 items, all of which were intended to capture performance goals. Factor 2 accounted for 13.7% of the total variance and comprised 14 items, all of which were intended to capture surface goal. Factor 3 accounted for 11.3% of the total variance and comprised 16 items, all of which were intended as mastery goal items. Based on the factor loadings, we can label Factors 1, 2 and 3 as performance goal, surface goal and mastery goal respectively.

Table 9
Factor Loadings of Achievement Goal Items (Study 2)

	Factor		
	1	2	3
Achievement Goal Items	Performance goal	Surface goal	Mastery goal
I feel most happy when I learn something new in this subject.[1]			.752
My goal for this subject is to learn as much as possible.[1]			.722
I work hard because I enjoy this subject.[1]			.711
I enjoy studying this subject because I get to learn new things.[1]			.691
I enjoy challenging topics even if it is difficult to learn.[1]			.676
I study hard for this subject so that I will have a good grasp of the subject.[1]			.651
For this subject, I think I have failed if I do not learn as much as I can.[1]			.550
For this subject, I feel most successful when I understand all the topics.[1]			.535
I read up on this subject in my free time so that I can better understand this subject.[1]			.511
For this subject, I enjoy the challenge of difficult assignments because they help me understand the subject better.[1]			.492
For this subject, I sometimes revise what I have learnt previously even though it is not going to be tested.[1]			.478
Understanding everything that is taught in this subject is more important than getting higher marks than my friends.[1]			.471
I work hard for this subject so that I am sure I understand the subject.[1]			.466
It is most important for me to understand thoroughly whatever I am taught in this subject.[1]			.450
I would do supplementary readings in order to better understand this subject.[1]			.438
I sometimes spend my free time doing extra readings so that I am sure I understand the subject.[1]			.408

Table 9 (cont'd)
Factor Loadings of Achievement Goal Items (Study 2)

Achievement Goal Items	Factor		
	1 Performance goal	2 Surface goal	3 Mastery goal
I study hard for this subject so that I can do better than my friends in tests/exams.[2]	.854		
It is most important for me to perform better than my friends in this subject.[2]	.821		
My goal for this subject is to get a better grade/mark than my friends.[2]	.812		
I study hard for this subject so that I will not get poorer results than my friends.[2]	.802		
For this subject, I feel most successful when I score better than my friends.[2]	.794		
I feel most happy when my grade/mark for this subject is not lower than that of my friends.[2]	.730		
I feel most happy when my grade/mark for this subject is higher than that of my friends.[2]	.706		
Even when I score very well in the tests/exams for this subject, I feel sad if the grade/mark is lower than what my friends got.[2]	.705		
My goal for this subject is not to fare worse than my friends.[2]	.690		
Getting higher marks than my friends in this subject is more important than understanding everything that is taught.[2]	.688		
For this subject, I feel most successful when I do not fare worse than my friends.[2]	.667		
It is most important for me not to fall behind my friends in this subject.[2]	.650		
For this subject, I think I have failed if I do not score as well as my friends.[2]	.634		
For this subject, I just want to avoid getting lower grades/marks than my friends.[2]	.629		
I want to do well in this subject so that my friends and parents will not think that I am a weak student.[2]	.489		
As long as I pass, it doesn't matter that my friends do better than me.[3]		.779	
I just want to pass this subject.[3]		.697	
Scoring an A for this subject would be nice, but passing is enough for me.[3]		.692	
For this subject, I do not mind falling behind my friends as long as I do not fail.[3]		.686	
I study just enough so that I can pass the tests/exams.[3]		.679	
For this subject, I feel most successful when I pass.[3]		.639	
I feel most happy when I pass this subject.[3]		.637	
As long as I do not fail in this subject, I won't regard myself as a failure.[3]		.595	
Passing this subject more important than getting higher marks than my friends.[3]		.595	
I study just enough so that I will not fail the tests/exams.[3]		.550	
I would rather study just enough to pass the tests/exams in this subject than cover the entire syllabus.[3]		.495	
For this subject, I feel most successful when I do not fail.[3]		.475	
If I do not understand a topic in this subject, I will skip it as long as I think I can still pass the tests/exams.[3]		.463	
I feel most happy when I do not fail this subject.[3]		.446	

Note:
(1) [1] represents items originally intended for Mastery goal orientation, [2] represents items originally intended for Performance goal orientation, [3] represents items originally intended Surface goal orientation
(2) Items with loadings less than .40 are not shown. Only loadings of .40 and above are presented.

Majority of the items loaded on the goal they were designed to capture. Table 10 lists the items in the revised questionnaire that did not load well on the intended factors. Several of the discarded items were the new items that were designed based on participant's responses during study 1 interview. It is noteworthy that even though participants in study 1 agreed that it was important to capture parents' expectations in performance goal, all new performance goal items that tried to account for this aspect were discarded. This may be due to the phase of life most participants are in. Unlike with a student in primary or secondary school, parents are less likely to impose explicit expectations on undergraduates. They may have general expectations but precise standards are unlikely. This could be a result of decreased involvement in the study process. As a result, parental expectation may not be the focus of many students. This finding also highlights the need to conduct psychometric tests to ensure that items deemed as necessary during the construction process are indeed statistically good.

Table 10

Discarded Items (Study 2)

If I do not understand a topic in this subject, I will ask my teachers/friends to explain until I understand fully, before studying it.[1]

I study hard for this subject so that I will not be incompetent. [1]*

If I do not understand a topic in this subject, I will just memorize it anyway in order to score in the tests/exams.[2]

I work hard because I want to demonstrate to myself that I am good in this subject.[2]

I study hard for this subject so that I can meet or exceed my parents' expectations. [2]*

My goal for this subject is to meet or exceed my parents' expectations. [2]*

For this subject, I feel most successful when I meet or exceed my parents' expectations.[2]*

It is most important for me to meet or exceed my parents' expectations in this subject.[2]*

It is most important for me not to fail this subject.[3]

It is most important for me to pass this subject.[3]

My goal for this subject is not to fail.[3]

For this subject, I do not enjoy difficult assignments because I am less likely to pass.[3]

I aim to achieve just the minimum requirements for this subject so that I can move on to the next level.[3]

This subject is not a priority to me.[3]*

Note: [1] represents items originally intended for Mastery goal orientation, [2] represents items originally intended for Performance goal orientation, [3] represents items originally intended Surface goal orientation

* indicates new items that were designed based on participants' responses during study 1 interview

Internal Consistency

Reliability analysis was conducted to ascertain the interrelatedness within each set of items. Results showed that there was high internal consistency for each of the three goal

orientation measures. For mastery goal, the 16 items retained from the EFA yielded a

Cronbach's alpha of .90; for performance goal, the 15 items retained from the EFA yielded a

Cronbach's alpha of .94; for surface goal, the 14 items retained from the EFA yielded a

Cronbach's alpha of .90.

Inter-correlations between the 3 goal orientations

Table 11 displays how the three goal orientations are associated with each other. All

three goal orientations were found to be unrelated to each other, demonstrating that they are 3

separate constructs.

Table 11
Inter-correlations between 3 Goal Orientations (Study 2)

	Mastery	Performance
Mastery	-	-
Performance	.05	-
Surface	-.06	.08

Relationship with school-related variables

Table 12 displays the relationship between the three goals and the school-related

variables. Findings demonstrated that the 3 goal orientations have separate nomological

networks and are distinctly different in their associations with the school-related variables.

Table 12
Correlations between Goal Orientations and School-Related Variables (Study 2)

Goal Orientations	Worry	Academic self-esteem	Deep Processing	Surface Processing	Disorganisation	Competence Expectancies
Mastery	.09	.19**	.53***	.10	-.10	.31***
Performance	.28***	-.01	.07	.38***	.22***	.09
Surface	.13*	-.33***	-.12*	.18**	.44***	-.26***

***$p < .001$ level.
** $p < .01$ level.
* $p < .05$ level.

Mastery goal. This goal orientation was unrelated to worry and surface processing,

consistent with research findings (Cho & Sim, 2008; Elliot & McGregor, 2001; Elliot,

McGregor & Gable, 1999). According to Elliot, McGregor and Gable (1999), mastery goal is

positively related to deep processing and negatively related to disorganisation. This was only partially demonstrated in the present study; mastery goal was positively related to deep processing but unrelated to disorganisation. This goal was also positively correlated with academic self-esteem and competence expectancies as was found in other studies (Cho & Sim, 2008; Elliot & Church, 1997; Skaalvik, 1997).

Performance goal. This goal was not associated with academic self-esteem and competence expectancies, as was demonstrated in Cho and Sim's (2008) study. Previously, of the three processing styles, only surface processing was found to have a significant relationship with performance goal (Cho & Sim, 2008; Elliot & McGregor, 2001); deep processing and disorganisation was unrelated to this goal orientation. In the present study, surface processing and disorganisation were both found to be positively related with performance goal while deep processing was not significantly associated with performance goal. Findings indicated that worry was also positively related to this goal.

Surface goal. This goal was significantly related to all the school-related variables examined in this study. It was positively related to worry, surface processing and disorganisation. Surface goal was also found to be negatively associated with academic self-esteem and competence expectancies. This pattern of findings is similar to that of Cho and Sim (2008), with the exception of deep processing. This school-related variable was found to be unrelated to surface goal in the previous study, but in this study, it was negatively correlated.

The correlations between goal orientations and school-related variables were compared with that of a previous study (Cho & Sim, 2008) conducted in the same undergraduate population. Most of the correlations were similar in strength and direction. Only 3 associations differed – mastery goal and disorganisation, performance goal and disorganisation, surface goal and deep processing; the difference was in the significance of

the correlation. In the previous study, relationship between mastery goal and disorganisation was significant and negatively related, performance goal and disorganisation did not have a significant relationship, surface goal and deep processing were also not significantly correlated. However, it should be noted that even when the correlation was not significant, the direction of the relationship was similar across the two studies. Moreover, the difference in magnitude was similar too (difference not exceeding $r = .16$). Table 13 highlights the associations that are common between the present study and, Cho and Sim's (2008) study.

Table 13
Relationship with school-related variables across the two studies of interest

Goal Orientations	Worry	Academic self-esteem	Deep Processing	Surface Processing	Disorganisation	Competence Expectancies
Mastery	Not related	Positive	Positive	Not related	Negative [1]	Positive
Performance	Positive	Not related	Not related	Positive	Positive [2]	Not related
Surface	Positive	Negative	Negative [3]	Positive	Positive	Negative

[1] indicates that correlation was not significant in present study but negative in previous study.
[2] indicates that correlation was positive in the present study but not significant in previous study.
[3] indicates negative in the present study but not significant in the previous study.

Dominant Goal Orientation

Results showed that 97.3% of the participants indicate having a dominant achievement goal; 72.2% indicated possessing a dominant mastery goal, 15.9% indicated possessing a dominant performance goal and 9.2% indicated having a dominant surface goal. These findings are comparative to that of (Cho and Sim, 2008). The intuitive hypothesis is that an individual's dominant goal should coincide with the goal orientation that the individual scored highest for. This was the case for 70.8% of participants; the highest scoring goal orientation of the remaining 29.2% was different from their indicated dominant goal. That is to say, using highest scores inaccurately identified the dominant goal in almost 30% of the cases. Further research is necessary to determine if this is an artefact of the current analysis or a real limitation of the method. A two-way contingency table was also conducted to evaluate how much agreement there was between the highest scoring goal and an

individual's dominant goal as identified by the 3-item measure. Results indicated that there

was good agreement, *phi* = .53, *p* < .001. This suggests that it is possible to predict one's

dominant goal by examining his scores for the 3 goal orientations, though it is not the most

accurate method.

The results supported the posited three factor model. Findings suggest that the

questionnaire designed in study 1 captures mastery, performance and surface goals. As with

Cho and Sim's (2008) study, there was no achievement motivation and fear of failure

distinction. This is unlike the findings of other research (Elliot & McGregor, 1997; Shih,

2005; Skaalvik, 1997; Wang et al., 2007) where the existence of this distinction has been

clearly established. This could be because motivation that underlies behaviour may not be

immediately obvious to the conscious self. So in responding to the questionnaire,

participants were required to engage in meaningful introspection. If participants were not able

to commit to this process, the findings would be unable to tease apart the two motivations.

This is a limitation that the study faces. An alternative possibility is that of context. The

current study sampled Singaporean undergraduates and academics was the area of interest.

This combination of population type and setting is unique to Cho and Sim's (2008) study and

the current research. Study 1 has offered a possible explanation for this phenomenon in the

Singapore undergraduate academic context. Participants endorse both motivations in the

responses because both motivations work in tandem; the less dominant motivation

reinforcing the more dominant motivation.

In study 2, the questionnaire developed in study 1 was revised, discarding items that

were found to be not useful in capturing the three goal orientations. Findings also shed light

on how these goals operate – the nomological network and the absence of an achievement

motivation and fear of failure distinction – among Singapore psychology undergraduates. In

addition, results suggest that an individual's dominant goal can also be identified by another

method other than the adapted Van Yperen (2006) measure: the goal orientation that an individual scores highest for. This method demonstrated some limitation and awaits further research. In order to establish the validity of the achievement goal questionnaire within the Singapore undergraduate academic setting, a third study was conducted with the objective of replicating the findings of the current study. As both studies 1 and 2 sampled psychology undergraduates, the subsequent study sought to extend the sample beyond psychology students.

<div align="center">Study 3</div>

The primary aim of study 3 was to replicate study 2. This study sought to achieve the following: (1) empirically validate the questionnaire that was revised in study 2, (2) study the relationship between the goal orientations and school-related variables and (3) examine the relationship between individual's dominant goal and the pattern of response to the 3 goal orientation measures.

<div align="center">*Method*</div>

Participants

One hundred and six undergraduates participated in study 3. All participants were students of the Faculty of Arts and Social Sciences at NUS. Participants were reimbursed monetarily ($5) for the time spent on this study. Of the participants, 88.7% were Chinese, 5.7% were Malay, 1.9% were Indian, and 2.8% were of other ethnicity; 74.5% of the sample were female. All participants were Year 2, 3 and 4 undergraduates, between the ages of 19 and 28 years. The mean age was 21.17 years. In the sample, 45.3% were in their second year of study, 36.8% were in the third year and 17.9% were in Year 4. In order to extend the findings of this research beyond psychology undergraduates, participants majoring in other subjects were recruited. Majority of participants majored in Economics (31.1%), followed by Communications and New Media (26.4%). The remaining participants majored in English

Language (8.5%), Social Work (7.5%), Sociology (6.6%), Political Science (4.7%), History (3.8%), Geography (3.8%), Chinese Studies (3.8%), Japanese Studies (1.9%) and Philosophy (1.9%).

Procedure

The revised achievement goal questionnaire – comprising the mastery goal, performance goal and surface goal measures developed in study 1 and refined in study 2 – were compiled with a worry scale, academic self-esteem scale, processing style measures and questions assessing competence expectancies to form the questionnaire used in the present study. Also included in the questionnaire were a dominant goal scale and demographic items. Participants completed the questionnaire online at a time convenient for them. The items in the achievement goal questionnaire are displayed in Table 9. Participants were assured that their responses would be kept confidential.

Measures

Achievement goal measure. This measure consisted of 45 items designed to capture mastery goal, performance goal and surface goal. There were 16 mastery goal items, 15 performance goal items and 14 surface goal items. The items were developed during study 1 and identified as good items in study 2. Participants were asked to indicate how well each statement described them on a 4-point scale – *does not describe me at all*, *describes me to a limited extent*, *describes me quite well*, *describes me very well*. Recognizing that the achievement goal one possesses is domain-specific, all items were phrased with reference to the participants' study of the subject they are majoring in. Participants responses were later averaged to give 3 mean scores; one score for each type of goal orientation.

Worry. This is the same scale used in study 2. Reliability analysis revealed that all items had good corrected item-total correlation (i.e., correlations were more than $r = .30$). In addition, analysis indicated that there would be no significant increase in Cronbach alpha if

any of the items were deleted. All items were retained for analysis. The worry measure showed good internal consistency ($\alpha = .90$).

Academic Self-esteem. The same 8 items used in study 2 was used in the present study. Reliability analysis demonstrated that all items had good corrected item-total correlation and the measure showed good internal consistency ($\alpha = .81$).

Processing Styles. The measures used to study deep processing, surface processing, and disorganisation were the same ones described in study 2. The Cronbach alphas in the present study is similar to that of study 2; all were reasonably substantial ($\alpha = .65$, $\alpha = .76$ and $\alpha = .85$ respectively).

Competence Expectancies. The same 3 items used to measure competence expectancies in study 2 was used here. The scale demonstrated good internal consistency ($\alpha = .80$).

Dominant Achievement Goal. This 3-item measure has been previously described in study 2.

Demographic variables. In addition to the items mentioned in study 2, participants were also asked to indicate which subject they were majoring in.

<div align="center">*Results and Discussion*</div>

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted using Amos 18.0 with the purpose of testing the achievement goal questionnaire's 3-factor structure found in study 2. The questionnaire comprised a large number of items so a method commonly used to deal with this issue was employed – parceling (VanZile-Tamsen, Testa & Harlow, 2006). Items were assigned to a parcel based on similarity to other items. Each parcel was made up of 3 to 4 items designed to measure the same goal orientation; each goal orientation measure had 4 parcels. Though this method may potentially lead to a loss of information on factor loadings

of individual items, it reduces the complexity of the model. When a large number of items are modeled, analysis is unlikely to yield good fit indices. But "models based on parceled data are more parsimonious" (Little, Cunningham, Shahar & Widaman, 2002). This research notes that parceling works on the assumption that items within the same parcel are unidimensional. Also, parceling may hide latent constructs in the data. The former has been addressed by study 2; items parceled together have been shown to be associated with the same factor. To ensure that the parcels were indeed capturing the construct they were intended to capture, Modification Indices (MI) were examined. In the event that regression weights suggest an alternative loading, the items within the parcel would be studied to determine if the items have been appropriately assigned to that parcel. In total, the model specified 12 variables and the underlying factors in the CFA were the 2 achievement goals – mastery, performance and surface goals (refer to figure 1).

Results of the chi-square goodness-of-fit test suggested that the three-factor solution did not adequately fit the data, $\chi^2 (51) = 106.62$, $p < .001$. However, "both the sensitivity of the likelihood ratio test to sample size and its basis on the central χ^2 distribution, which assumes that the model fits perfectly in the population, have led to problems of fit that are now widely known." (Byrne, 2001, pp.81). Models, no matter how good, cannot be expected to fit the real world data perfectly. The findings were therefore not unexpected. Other goodness-of-fit indices were taken into consideration in the present analysis. For this analysis, Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI) and Root-Mean-Square Error of Approximation (RMSEA) were also examined.
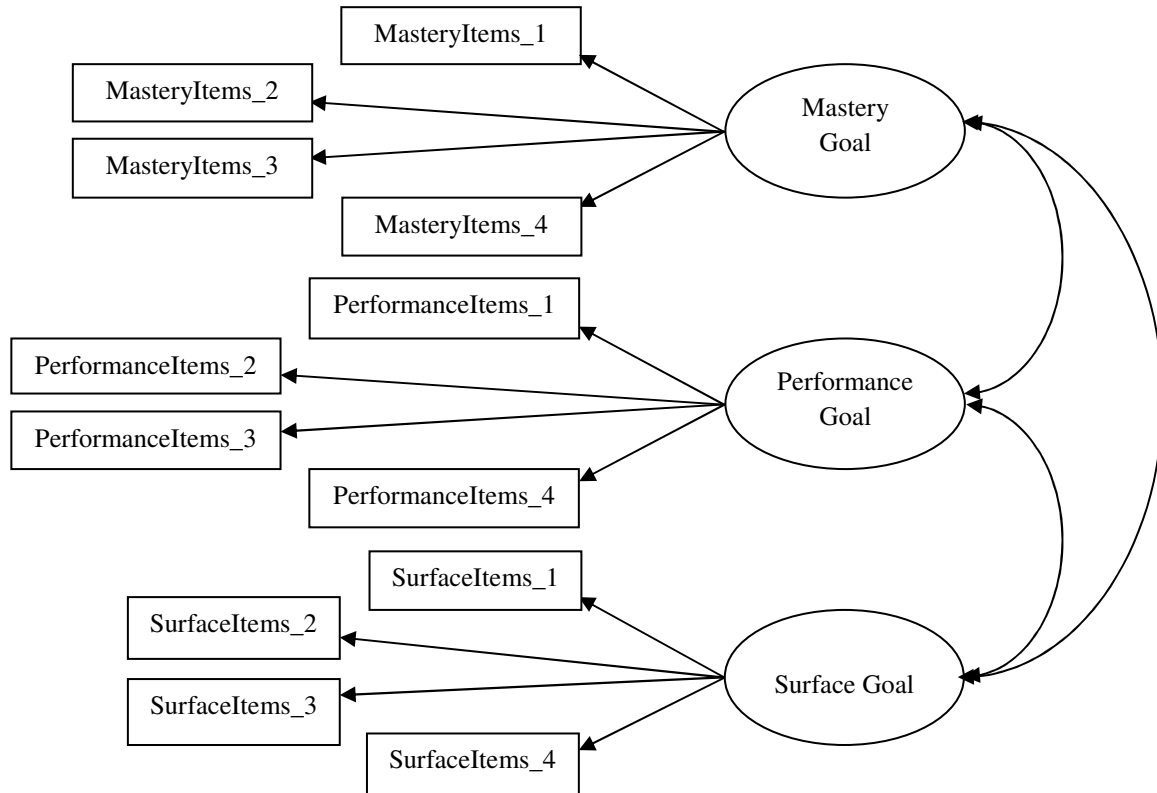
Figure 1. Initial Model (Study 3)

The NFI was .85, where values greater than .90 indicate good fit (Bentler, 1992). The

TLI and CFI were .89 and .91 respectively, where values greater than .95 (Hu & Bentler,

1999) indicate good fit. RMSEA was .10, where a value of less than .06 indicates good fit

(Hu & Bentler, 1999). Although the fit indices did not fall within the adequate range, some

values fell close to the recommended cut-off. A review of the Modification Indices (MI) for

the regression weights revealed that one of the parcels intended to measure surface goal

cross-loaded with performance goal (MI = 22.53). This misspecification could mean that the

parcel of items, in addition to measuring surface goal, also measured performance goal.

Alternatively, it could indicate that this parcel would load more appropriately on performance

goal.

The items within this parcel were "As long as I pass, it doesn't matter that my friends

do better than me.", "For this subject, I do not mind falling behind my friends as long as I do

not fail.", "Scoring an A for this subject would be nice, but passing is enough for me." and

"Passing this subject more important than getting higher marks than my friends.". Based on the definitions of performance and surface goals, it was not clear why these items would cross-load on performance goal. However, upon closer examination, it was discovered that of the 4 surface goal parcels, only this parcel contained items that made references to friends. As mentioned previously, performance goals are characterized by a desire to meet or better the standards of others. That is to say, significant others are an important point of reference. Though the three surface goal items did not use peer performance as a standard to meet, making passing reference to their performance seem to tap on performance goal too. It is noteworthy that in study 2, these three items loaded strongly on the surface goal factor. The incongruence between results of studies 2 and 3 could be due to differences in the subject of interest. In study 3, participants were told to refer to the subject they majored in, unlike in study 2. In the context of one's major, it is expected that students are less likely to set surface goals. As such, items that make reference to peers could possibly elicit information on performance goals. The model was subsequently respecified; the three items that made references to friends were deleted, and the item "Scoring an A for this subject would be nice, but passing is enough for me." was placed in a different parcel. There were 11 parcels in the subsequent analysis.

CFA was conducted on the re-specified model, henceforth referred to as model 2. Chi-square goodness-of-fit test indicated that the re-specified three-factor solution adequately fit the data, $\chi^2 (41) = 51.67$, $p = .12$. The NFI was .91 where values greater than .90 indicate good fit. The TLI and CFI were .97 and .98 respectively, where a value greater than .95 indicates adequate fit. Similarly, the RMSEA was .05, where a value of less than .06 indicates adequate fit. Overall, model 2 fit the data better than the original model. There were no significant cross-loadings; the variables loaded on the factors they were designed to capture. Model 2 was also compared to a single factor model, $\chi^2 (44) = 353.22$, $p < .001$. Results

indicated that the 3-factor model was a significantly better fit than a 1-factor model, $\Delta\chi^2(3)=$ 301.55, $p < .001$. Figure 2 displays the revised model while table 14 lists the revised achievement goal measure.
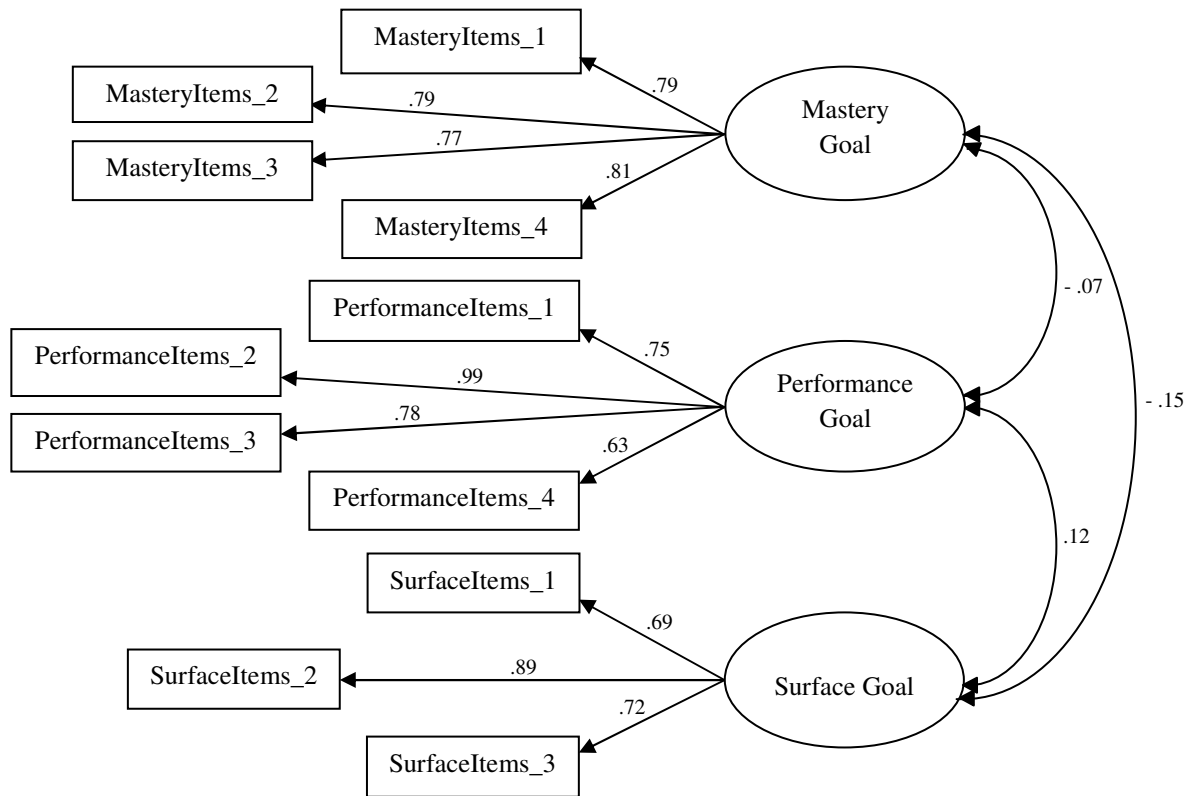

Figure 2. Model 2 (Study 3)

Internal Consistency

Reliability analysis was conducted to ascertain the interrelatedness within each set of items. Results showed that there was high internal consistency for each of the three goal orientation measures. For mastery goal, the 16 items yielded a Cronbach's alpha of .89; for performance goal, the 15 items yielded a Cronbach's alpha of .93; for surface goal, the 11 items retained from the CFA yielded a Cronbach's alpha of .87.

Table 14
Revised Achievement Goal Measure (Study 3)

My goal for this subject is to learn as much as possible.[M1]

I feel most happy when I learn something new in this subject. [M1]

It is most important for me to understand thoroughly whatever I am taught in this subject. [M1]

I enjoy studying this subject because I get to learn new things. [M1]

For this subject, I sometimes revise what I have learnt previously even though it is not going to be tested. [M2]

I enjoy challenging topics even if it is difficult to learn. [M2]

I read up on this subject in my free time so that I can better understand this subject. [M2]

I sometimes spend my free time doing extra readings so that I am sure I understand the subject. [M2]

I work hard for this subject so that I am sure I understand the subject. [M3]

Understanding everything that is taught in this subject is more important than getting higher marks than my friends. [M3]

I study hard for this subject so that I will have a good grasp of the subject. [M3]

I work hard because I enjoy this subject. [M3]

For this subject, I feel most successful when I understand all the topics. [M4]

For this subject, I enjoy the challenge of difficult assignments because they help me understand the subject better. [M4]

For this subject, I think I have failed if I do not learn as much as I can. [M4]

I would do supplementary readings in order to better understand this subject. [M4]

I feel most happy when my grade/mark for this subject is higher than that of my friends.[P1]

I study hard for this subject so that I can do better than my friends in tests/exams. [P1]

My goal for this subject is to get a better grade/mark than my friends. [P1]

It is most important for me to perform better than my friends in this subject. [P1]

I study hard for this subject so that I will not get poorer results than my friends. [P2]

I feel most happy when my grade/mark for this subject is not lower than that of my friends. [P2]

My goal for this subject is not to fare worse than my friends. [P2]

For this subject, I feel most successful when I score better than my friends. [P2]

Getting higher marks than my friends in this subject is more important than understanding everything that is taught. [P3]

It is most important for me not to fall behind my friends in this subject. [P3]

For this subject, I just want to avoid getting lower grades/marks than my friends. [P3]

For this subject, I feel most successful when I do not fare worse than my friends. [P3]

Even when I score very well in the tests/exams for this subject, I feel sad if the grade/mark is lower than what my friends got. [P4]

For this subject, I think I have failed if I do not score as well as my friends. [P4]

I want to do well in this subject so that my friends and parents will not think that I am a weak student.[P4]

I study just enough so that I will not fail the tests/exams.[S1]

I feel most happy when I do not fail this subject. [S1]

For this subject, I feel most successful when I do not fail. [S1]

As long as I do not fail in this subject, I won't regard myself as a failure. [S1]

Scoring an A for this subject would be nice, but passing is enough for me. [S2]

I just want to pass this subject. [S2]

I study just enough so that I can pass the tests/exams. [S2]

I feel most happy when I pass this subject. [S2]

I would rather study just enough to pass the tests/exams in this subject than cover the entire syllabus.[S3]

For this subject, I feel most successful when I pass. [S3]

If I do not understand a topic in this subject, I will skip it as long as I think I can still pass the tests/exams. [S3]

Note: [M1] indicates items in MasteryItems_1, [M2] indicates items in MasteryItems_2, [M3] indicates items in MasteryItems_3, [M4] indicates items in MasteryItems_4, [P1] indicates items in PerformanceItems_1, [P2] indicates items in PerformanceItems_2, [P3] indicates items in PerformanceItems_3, [P4] indicates items in PerformanceItems_4, [S1] indicates items in SurfaceItems_1, [S2] indicates items in SurfaceItems_2, and [S3] indicates items in SurfaceItems_3.

Inter-correlations between the 3 goal orientations

Table 15 displays how the three goal orientations are associated with each other. As in study 2, all three goal orientations were found to be unrelated to each other, demonstrating that they are 3 separate constructs.

Table 15
Inter-correlations between 3 Goal Orientations (Study 3)

	Mastery	Performance
Mastery	-	-
Performance	-.08	-
Surface	-.15	.11

Relationship with school-related variables

Table 16 displays the relationship between the three goal orientations and the school-related variables in the current study. Findings provide additional support to the pattern of association found in study 2. It is important to note that even in cases when the significance of association between goal orientations and school-related variables were not similar across studies 2 and 3, the magnitude of association was similar. This could be explained by the weaker power in study 3 as a result of smaller sample size.

Table 16
Correlations between Goal Orientations and School-related Variables (Study 3)

Goal Orientations	Worry	Academic self-esteem	Deep Processing	Surface Processing	Disorganisation	Competence Expectancies
Mastery	-.03	.21*	.57***	-.05	-.17	.22*
Performance	.21*	.06	-.01	.31**	.21*	.06
Surface	.34***	-.46***	-.10	.25*	.53***	-.37***

*** $p < .001$ level.
** $p < 0.01$ level.
* $p < 0.05$ level.

Mastery goal. The relationship between this goal and the school-related variables is similar to that found in study 2. Mastery goal was unrelated to worry, surface processing and disorganisation, but positively associated with academic self-esteem, deep processing and competence expectancies.

Performance goal. The relationship between performance goal and the school-related variables in study 3 is similar to the findings in study 2. The goal was positively associated with worry, surface processing and disorganisation. It was also found to be unrelated to academic self-esteem, deep processing and competence expectancies.

Surface goal. The relationship between this goal and the school-related variables was not entirely the same as the findings in study 2. Surface goal was positively related to worry, surface processing and disorganisation, and negatively related to academic self-esteem and competence expectancies. However, unlike in study 2, it was not significantly related to deep processing.

Dominant Goal Orientation

Results showed that 97.2% of the participants indicated having a dominant achievement goal. The findings are not similar to study 2 – a smaller proportion of participants (56.6%) indicated possessing a dominant mastery goal and a larger proportion (34.0%) indicated possessing a dominant performance goal. The percentage of participants who indicated possessing a dominant surface goal orientation remained similarly small (6.6%). The intuitive hypothesis is that an individual's dominant goal should coincide with the goal orientation that the individual scored highest for. This was the case for 68.9% of participants; the highest scoring goal orientation of the remaining 31.1% was different from their indicated dominant goal. A two-way contingency table was also conducted to evaluate how much agreement there is between the highest scoring goal and an individual's dominant goal as identified by the 3-item measure. Results indicate that there is good agreement, *phi* = .884, $p < .001$. The above findings lend support to the findings of study 2, suggesting that it is possible to predict one's dominant goal by comparing his 3 goal orientation scores though approximately one third of predictions will be incorrect. It is interesting to note that the

proportion of non-association seemed to be rather stable. Future research could explore the reason for this limitation.

General Discussion

The overarching aim of this research was to develop an achievement goal questionnaire that is reliable and valid, appropriate for the Singapore undergraduate context. This research employed a combination of qualitative and quantitative methods of research in developing the questionnaire. The qualitative method provided a wealth of information that aided the creation of new items and the rewording of existing items. This was possible through one-on-one interviews where participants were asked to critique the items based on their personal experiences. Such a set-up also gave the researcher the opportunity to clarify and probe comments that were made. As a result, the data obtained from participants was clear and useful for questionnaire development. The quantitative method that was subsequently employed ensured that the questionnaire was empirically valid and demonstrated good psychometric properties.

After content validation (study 1), EFA (study 2) and CFA (study 3), the present research has developed a 42-item achievement goal measure that captures mastery, performance and surface goals. Ten new items were added to the achievement goal measure at the end of study 1. These items were created to capture aspects that participants felt were lacking in the initial questionnaire. Of the 10 new items added, 6 items were subsequently discarded in study 2 due to poor factor loadings. Even though they captured an aspect not accounted for in the initial questionnaire, empirically they were not useful in capturing the goal orientations within the Singapore undergraduate academic setting. This highlighted the need to empirically validate psychological measures even when items have face validity. In study 3, the CFA conducted yielded a further reduction of items. Since the purpose of the present research is to develop a measure that is not limited to Psychology students, it was

decided that the final measure be based on the results of study 3 rather than study 2. The final measures (for each of the three goals) demonstrated good internal consistency. It should be noted that the achievement goal questionnaire developed in this research is domain-specific. That is to say, the measure was designed to be administered with reference to a subject of interest and not overall academic behaviour.

Further evidence of the validity of this measure is in the nomological network of the factors it captured. The relationship between the goals captured and the school-related variables were consistent with past research and similar across the two undergraduate populations sampled in this research. Mastery goal was positively related to deep processing. It makes intuitive sense that an individual who seeks to develop competence would adopt a processing style that allows him to "challenge the veracity of information encountered and attempt to integrate new information with prior knowledge and experience" (Elliot, McGregor & Gable, 1999, pp. 549). During the interviews, participants revealed that their goal orientations changed as they gained proficiency in a particular subject. Mastery goals were usually set when participants felt that they were performing well in the subject. The decision to set mastery goals reflects the confidence in one's own ability in the subject and the belief in one's aptitude to do well. This accounts for the positive association between mastery goal and the two variables – academic self-esteem and competence expectancies.

Performance goal was positively related to worry, surface processing and disorganization. This set of findings is similar to that found in Elliot and colleagues' research (Elliot & McGregor, 2001; Elliot, McGregor & Gable, 1999). Performance goal is characterized by a desire to meet or better the standards of significant others. Failing to meet that standard, one risks embarrassment or damaging one's self-esteem. Having such thoughts, it is no wonder the individual with performance goal is likely to worry. There are also other implications. The individual's priority would not be to master the subject but to adopt any

study strategy (i.e., disorganization) that helps him remember as much as possible in order to score in the subject (for example, surface processing).

Surface goal orientation is new to achievement goal research and is defined as "the goal of just passing exams without in-depth understanding or making much effort" (Salili & Lai, 2003, pp. 54). The current research has provided greater support for surface goals as a legitimate goal orientation which must be accounted for, alongside the established mastery and performance goal orientations. The three studies have demonstrated that surface goals can be empirically assessed and are nomologically distinct from the other two goals. Surface goal was positively related worry, surface processing and disorganization, but negatively related to academic self-esteem, deep processing and competence expectancies. It seems that surface goals are often set when one is not good in the subject or uncertain about their standard during the initial contact with the subject (Cho, 2008). This positive relationship with worry and negative association with academic self-esteem and competence expectancies may be a result of feeling inadequate. It has also been previously suggested (Cho & Sim, 2008) that surface goals could be set to mask students' insecurity or to protect them from embarrassment. If a student recognises that he or she is not good in a particular subject, he or she may decide to set surface goals so as to not risk looking incompetent should he or she not do well despite investing time and effort. These explanations presume a causality that awaits further research.

This research has demonstrated that the achievement goal questionnaire is reliable and valid within the Singapore undergraduate population. However, one limitation of this research is the lack of criterion-related validity evidence. Future research can take into account the outcomes of achievement motivation, such as exam performance and sustained interests in the subject in testing the criterion-related validity of the questionnaire.

As the definition suggests, individuals with surface goals seek to pass without much concern for understanding the material they are taught. A desire to put in minimal effort may mean that the student does not maintain a structured organised approach, or an approach that requires time and effort (i.e., deep processing) because there is no need to. It is not necessary to keep to one approach; rather, students adopt the method that is most convenient at a point in time. However, findings are correlational (i.e., unable to establish causality) so it is also possible that due to one's inability to find an effective study strategy, the individual does not perform well in the subject and therefore sets surface goals. In this explanation, surface goals are set as a result of careful calculation after realising one's lack of aptitude in the subject. Such an approach would distribute limited resources (i.e., time and effort) to other subjects where one has a better chance of doing well. The interview findings in the study 1 support this argument. Further research can be conducted to uncover the causal links between surface goals and study strategy.

These findings have demonstrated that mediocre performance (as defined by society) may not be due to a lack of motivation. In some cases, second-rate performance may be the result of an individual's surface goals. This may be due to a calculated decision to redistribute limited resources to other subjects or areas in life that one is more adept in. Such an individual should not be considered to be lacking in motivation because overall, he or she is actively approaching the subject in a manner that maximises his or her gains. One would expect that a typical educator would encourage the student with surface goals to set performance or mastery goals, especially if the subject is one that the educator is teaching. It would however, be interesting to examine if it is necessary to correct surface goals and if the change would benefit the student academically and psychologically. Such a study would better our understanding of the function of setting surface goals.

An unexpected finding of surface goals was discovered in study 3. Results suggest that within the context of one's major, surface goal items that made reference to peer performance were found to load more appropriately on performance goals. Future attempts to study surface goals should be careful not to include the comparative component.

The proportion of participants who indicated possessing surface goal orientation was small; 13.7% in study 1, 9.2% in study 2 and 6.6% in study 3. This is expected because of the academic context of interest – the university. The academic process in Singapore filters out students who do not perform well academically as they move on to higher levels of study. Only approximately 10% of a cohort will meet university entry requirements. In order to get to the tertiary level, simply achieving 50% in grades will not be sufficient. As a result, the proportion of students seeking to just pass would understandably be smaller at the tertiary level than at a lower educational level. Also, in the university, instead of studying a combination of subjects pre-determined by the educational system and schools, students have some autonomy in selecting what they study. This may lead to setting higher goals because it is a subject they have selected, and in many cases, it will be the field they seek to pursue a career in. As a result, more students would set performance or mastery goals than surface goals in the tertiary level. It is interesting that there still exists a small proportion of students who possess surface goals at this level. As mentioned previously, simply passing would not get one very far. With such a standard, one may be able to progress in primary and secondary school. However, it would not be sufficient to get one promoted to pre-university institutions. This draws our attention to the possibility that what constitutes surface goals differ across educational levels. The minimum standard one sets has to consistently place the individual in a position where he or she is able to be successfully promoted to the next level; this individual has to constantly adjust the minimum standard he or she seeks to achieve. Future research can examine the differences in what constitutes "minimum standard" at the various

educational levels. This would give us a better understanding of surface goals and how it is defined.

Past research has demonstrated that within the same subject, different individuals do possess different dominant goals (Cho, 2008; Van Yperen, 2006). The present study took this one further, showing that the same individual can possess different dominant goals across different subjects. It is interesting to note that in study 2 and 3, the proportion of participants who possessed a dominant mastery goal and a dominant performance goal differed. In study 2, the sample consisted of students from different departments and faculties who were taking elementary psychology modules. Participants were asked to answer the questionnaire in reference to their study of psychology. Study 3 sampled students from different departments within the arts and social sciences faculty. Participants were asked to answer the questionnaire in reference to the subject they were majoring in. When the subject of interest was one's major, the proportion of students with dominant mastery goal was smaller and the proportion of participants with dominant performance goal was larger, than when the subject of interest was just one of the subjects participants were taking. This finding suggests that an individual does not necessarily seek to gain mastery in the subject they are majoring in. Possibly due to greater competitiveness towards one's major, a larger proportion of students are likely to possess dominant performance goal. It would be interesting to examine the distribution of goal orientations between majors and non-majors in future research. This would help us gain a better understanding of student motivation and how it changes depending on the subject in question. The adapted dominant goal measure, though closely rivalled by the single-item measure, demonstrated adequate accuracy in identifying one's dominant goal. Although the single-item was more straight-forward and would be much simpler to administer and compute, the three-item measure is more suitable for studies which require that participants be kept from knowing what the three goal types are. Findings also

discovered a new method of predicting an individual's dominant goal – simply comparing the 3 achievement goal scores; the goal with the highest score was the dominant goal in approximately 70% of the cases. This level of accuracy was similar across study 2 and 3, suggesting that 30% inaccuracy may be a characteristic limitation of the newer method. Future studies could examine this limitation.

The secondary objective of this research was to examine whether the achievement motivation and fear of failure distinction is empirically supported in the Singapore context. During the interview (study 1), most participants acknowledged the existence of the two motivations and the influence on their behaviour. Findings suggest that there is usually one motivation that is more dominant. Despite this, the results of EFA (study 2) and CFA (study 3) did not make a distinction between the two motivations. Past studies (Elliot & Church, 1997; Elliot & McGregor, 2001; Shih, 2005; Skaalvik, 1997; Wang et al., 2007) have clearly distinguished between the two, demonstrating that they operate hand-in-hand with goal orientations but studies that focused on Singaporean students in the academic arena (Cho & Sim, 2008 and the present study) have been consistently unable to distinguish between the two underlying motivations. A possible explanation is that the two motivations work in tandem – the less dominant motivation reinforces the more dominant motivation – therefore, the achievement motivation and fear of failure distinction is not immediately obvious to the conscious self. As the participants of the local studies were possibly unable to commit to the process of meaningful introspection, research has been unable to tease apart the two motivations. However, this explanation is found lacking the face of another local study (Wang et al., 2007). The distinction was observed among Singapore students in the sporting context. Further research is necessary to examine why there are differences in results despite similarities in the population sampled. At present, findings seem to suggest that this 3-factor framework is unique to Singapore students in the academic setting.

The primary objective of this research was to develop an achievement goal questionnaire that is valid and accurately captures the three goal orientations posited in research – mastery goal, performance goal and surface goal – in the Singapore undergraduate academic setting. Further research could be done to examine the validity of this achievement goal measure in the other student populations. With this measure, future research can delve into the dynamics of achievement goals across time; whether goals change across time, the factors that trigger the change, and the effects of such change. In the development of the questionnaire, the findings have also provided further support for the existence of the newly introduced surface goals. The presence of this goal orientation challenges the intuitive belief that an individual who is motivated must necessarily get good grades. It also presents an unchartered area of motivation that research can venture into. The achievement goal measure developed in this research has demonstrated good psychometric properties in the Singapore undergraduate population and will likely be helpful in both the school and research domains.

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Appendix A: Questions for Semi-structured Interview (Study 1)

(Note: This is a guide. Additional questions should be asked during the interview to clarify or probe a comment a participant makes.)

Section 1: Clarify participant's understanding of the 3 goal orientations

In Part 1 of this study, you indicated that you possess mastery/performance/surface (delete where applicable) goal orientation in your study of Psychology/*the non-Psychology module indicated in Part 1*(delete where applicable). Why do you say so?

Section 2: Critique questionnaire items

This study seeks to develop good questionnaire items that accurately capture goal orientations. Your responses in this interview will help us to fine-tune the items and design additional items. Please complete this short survey with reference to Psychology / the non-Psychology module indicated in Part 1 (delete where applicable).
(Note: There are three different copies of the survey; one for each goal orientation. Participants should be given the copy that corresponds with their dominant goal orientation.)

Qn 2.1 Which questions target the salient behaviours and attitudes associated with mastery/performance/surface (delete where applicable) goal orientation? Why?

Qn 2.2 Which questions are unnecessary or unhelpful in identifying mastery/performance/surface (delete where applicable) goal orientation? Why?

Qn 2.3 Do any of the questions overlap?

Qn 2.4 Are there any ambiguous or confusing statements?

Qn 2.5 What are some other behaviours and attitudes these questions failed to target, but are strongly associated with mastery/performance/surface (delete where applicable) goal orientation?

Section 3: Examine achievement motivation and fear of failure distinction

Qn 3.1 Do these two items capture different things?
(Note: Point out the pair that corresponds with the participant's expert group)

Mastery Goal
1. I study hard for this subject so that I will have a good grasp of the subject.
2. I study hard for this subject so that I will not forget what I have been taught.

Performance Goal
1. I study hard for this subject so that I can do better than others in tests/exams.
2. I study hard for this subject so that I will not get poorer results than my friends.

Surface Goal
1. I study just enough so that I can pass the tests/exams.
2. I study just enough so that I will not fail the tests/exams.

(Note: Give a brief description of achievement motivation and fear of failure before proceeding to the final questions.)

In every academic situation, students are faced with 2 possible outcomes – success or failure. Correspondingly, there are 2 types of motivation that drives the behaviour of a student:
Achievement Motivation – the individual is sensitive to the possibility of success and works to approach that.
Fear of Failure – the individual is sensitive to the possibility of failure and works to avoid that.

Qn 3.2 From your own experience, do you think this distinction exists? Is it an important distinction?

Qn 3.3 Are the two types of motivation mutually exclusive?