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MASTER'S THESIS

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TITLE:
VALIDATION OF A PERFORMANCE MODEL IN ENTREPRENEURSHIP BASED ON SELF-EFFICACY, PERSONAL GOAL ORIENTATION AND ENVIRONMENT GOAL ORIENTATION USING STRUCTURAL EQUATION MODELING

AUTHOR		ADVISOR: OLGA GJERALD
Student number: 214510 …… ……	Name: RODRIGO FIGUEROA REYES …… ……	

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Content Table

Part 1: Contribution of this research project

Three are the main contributions that I pretend to provide through this research. First, I will combine four theoretical constructs that, to my knowledge, have not been worked through this way before. I mean that this research is attempting to validate and estimate the existing relationships between Self-efficacy, Perceived Personal Goal Orientation, Perceived Environment Goal Orientation and Perceived Personal Performance.

There is much evidence in the literature that has explored the connections between self-efficacy and the goal theory as I will show later. Those works used to focus on explaining how *setting goals* improves performance in a varied set of fields. Goals are "what an individual is trying to accomplish; it is the object or aim of an action" (E. Locke, Saari, L., Shaw, K., and Latham, G., 1981). There is some agreement that setting goals increase performance in two ways: first, there is a direct relation between setting goals and performance, and, second, goals and performance relationship is mediated by self-efficacy: *greater performance increase self-perceptions of competence, as a consequence, individuals would set even higher goals* (Edwin A. Locke & Latham, 1990).

However, for this project, my focus is on the analysis of ***goal orientation***. For the sake of a better understanding of this project, I have to explain -before going deeper- what is the difference between *"setting goals"* and *"goal orientation"*. The former refers to the individual's actions oriented to establish –formally or informally- future goals related to upcoming events. For example, when a university student is getting ready for final exams might set (as a goals) to obtain A or B grades only. The "goal orientation", which is the central concept involved in this project, refers to something a bit different: if individuals *perceive themselves or their environment* as performance oriented (PGO): focus on comparisons to others (i.e., I want the best grade of my class) - or as task oriented (TGO): focus on comparisons to one's self (i.e., I want to improve my last score in this class).

I will research these two goal orientations (TGO and PGO) separately. Personal Perceived Goal Orientation corresponds to personal perception toward a performance oriented goal (PGO) or a task oriented one (TGO); while, environment goal orientation (EGO) is defined by

how is perceived the main goal orientation of the immediate environment where subjects are engaged in (i.e., my perception about the main goal orientation of my working department). These two concepts, namely, Personal Goal Orientation (TGO/PGO) and Environment Goal Orientation (EGO), will be treated as separate constructs, where the environment will be measured in terms of *how task-goal oriented is perceived the environment by the entrepreneur.* Both of the orientations, personal and environmental orientations, represent different constructs, since the former is a perception about oneself, and the latter is a perception about the external environment. Some evidence suggests that those constructs are different, and determine different and independent effects on self-efficacy (Anderman, 1997; Albert Bandura, 1995; C. Dweck, & Leggett, E., 1988; B. Zimmerman, and Ringle, J. , 1981). I will test this out in this project working on an entrepreneurial business context.

A second contribution of this project is related to the methodological tool to be implemented. To confirm the existing relationships between Self-efficacy, Perceived Personal Goal Orientation (TGO and PGO), Perceived Environment Goal Orientation (EGO), and Perceived Performance, I will use a Structural Equation Modelling (SEM). The diagram showing all the relationships among variables is shown later on. At this regard, some of the studies using SEM were (E. Locke, and Latham, G., 2002; R. Wood & Bandura, 1989). These works did not work through goal orientations but only on the impact of goal setting.

Third, and a final contribution, this project focused on the relationships between Perceived Performance, Goal Orientations and Self-efficacy in an *international business-entrepreneurial* environment. A great part of the existing literature on self-efficacy and goal orientation is devoted to educational purposes. My attempt in this work will be to test out those conceptualisations in an entrepreneurial business environment. If results prove this model true, many interesting feedback may be done for early-stage entrepreneurs.

Part 2: Introduction and the research question

Entrepreneurship is a risky endeavour even though necessary to modern society. It is well known that a great percentage of first-year entrepreneurships will fail and many others will do

in the first four years of life. The death rate for those new comers into business is astonishing high. For example, according to the Bureau of Labour Statistics of the United States, in 2009 almost 24% died along the first two years of operations; in 2008, 25% did not finish its second year, and 37% did not survive its third year. In general terms, almost 50% of the new companies in the US will not survive the first four years of life (Statistics, 2010). Despite so, entrepreneurship is a big receptor of new investments. Again, in the US, only in the first quarter 2013, Venture Capital firms invested 6.36 billion dollars into companies, financing 752 projects in the entire country (Clarck, 2013).

A model of performance among entrepreneurs may impact positively to not only entrepreneurs but to the entire industry dedicated to venture capital. In concrete, a better understanding of variables impacting entrepreneurial performance can, in fact, reduce the financial risk associated to every new start-up, and to every new entrepreneur. This might represent an increase in the associated return on investment, and expand the interest for funding start-ups in those areas where investors are still more sceptical. This master project is devoted to the first step, which is represented by the validation of a performance model based on self-efficacy and goal orientation among international entrepreneurs and, thus expanding the understanding on what makes entrepreneurs successful.

First of all, we should wonder what kind of knowledge and skills are required to make entrepreneurs more likely to survive in this world. We could add: what kinds of characteristics are essential for increasing the likelihood of survival? If we think, possibly one of the –few- certain things that entrepreneurs will face in their early stages are failures and setbacks. Things never take the way they should. In the face of troubles, pressures and taxed situations, *some entrepreneurs will persist* in their endeavors even though failures and setbacks happen initially. At the contrary, others will decline to invest additional effort, will not persevere and will reduce their expectations.

Why? Why do different entrepreneurs will respond in such a different manner before adversity? Which are the mechanisms underlying that explain why some subjects will ultimately reach greater performance in entrepreneurship endeavours? My answer to those questions is that self-efficacy perceptions and goal orientations have been found to explain in a satisfactory way differences on performance in many different settings as education, sports, and others, as I will show later. Hypothetically, those constructs might also show a great

capacity to explain performance on entrepreneurial environments. Needs for positive thinking, right learning strategies, and ways for dealing with failures and setbacks may be regarded as similar in entrepreneurship as in other fields. So, why not to attempt to validate the hypothesis that those constructs, self-efficacy and goal orientation, are also valid to explain performance among entrepreneurs. Consequently, the main question that will guide us along this research can be put on the following terms:

Can self-efficacy perception, perceived personal goal orientation (TGO and PGO), and perceived environment goal orientation (EGO) explain the differences among the highest versus the lowest performing entrepreneurs?

Why self-efficacy and goal orientations?

By dealing with this research question, I will assume an agency perspective that understands human beings as "anticipative, purposive, and self-evaluating proactive regulators of their motivation and actions" (A. Bandura & Locke, 2003). An agency perspective implies specifically that human beings are proactively self-motivators through setting of goals and performance standards. Those goals and standards ultimately generate negative discrepancies: namely, failures in the achievement of expected outcomes, which trigger corrective actions to overcome those deficiencies (A. Bandura, 1995). Those corrective actions may be oriented to modify behaviour either toward improving performance, or toward reducing expectations about performance.

Parallel, it is important to add that cognitive processes play a role in the acquisition and retention of new behaviours patterns, because much of human development is carried out through modeling, i.e., observing others to identify how new behaviours are performed (A. Bandura, 1977). In practice, those models become guides for future actions. We are not only self-learners, totally outside from the social world but in reality we are able to learn from observing the way others behave under certain circumstances.

This cognitive process determines actions by foreseeing future scenarios and expectations about our own behaviours and outcomes (derived from these behaviours) which require a configuration of present actions. Thus cognitive processes determine goals and performance through the impact of goal setting and self-efficacy. In other words: *The higher perceived self-*

efficacy, the higher the self-set goals, and consequently the firmer the commitment to those goals (A. Bandura, 1995; Edwin A. Locke & Latham, 1990). Therefore, self-efficacy would impact positively, directly and also indirectly on performance. As it is possible to see, the theoretical framework in this thesis is mainly built upon findings of the social cognitive theory (A. Bandura, 1977), and the goal-setting theory (E. Locke, Saari, L., Shaw, K., and Latham, G., 1981).

A second point is the goal orientation framework. Entrepreneurship is –for many- a new challenge where they have scarce knowledge about new several challenges: i.e., characteristics of the industry, skills for managing new personal independence; skills for leading and engaging personnel, formulating strategies for dealing face to face with customers, and so on. To some extent, all entrepreneurs face new challenges when making the decision to continue an independent way. That is why goal orientation might be seen as an important factor: *goal orientation may determine if individuals will chose and use more effective learning strategies* when dealing with new tasks (Anderman, 1997; B. Zimmerman, and Ringle, J. , 1981). Not all strategies seem to be identically effective to undertake different and unknown tasks and not all situations seem to require identical strategies.

Those individuals with higher level of self-efficacy perceptions, for example, should develop more effective strategies (G. P. Latham, Winters, D., & Locke, E., 1994; E. Locke, and Latham, G., 2002; R. Wood & Bandura, 1989; B. Zimmerman, and Ringle, J. , 1981). Strategies seem to play a more important role on *complex tasks* than in simple ones given that goal-setting process results in higher performance when subjects have the ability to find appropriate strategies (E. Locke, Saari, L., Shaw, K., and Latham, G., 1981; E. A. Locke & Latham, 2002). The type of those self-set goals would also impact on performance through determining the kind of strategies implemented. Consequently, to sum up the expected effects, goal orientation is supposed to impact directly and indirectly (through self-efficacy) on performance. Following literature (Anderman, 1997; C. S. Dweck, 1986), in this research it is expected to present that TGO-orientation and (TGO-oriented) environment will show a positive direct and indirect (through self-efficacy) effect on performance; and, PGO-orientation will show a negative direct and indirect impact on performance.

PART 3: THE FIRST CONSTRUCT, PERCEIVED SELF-EFFICACY

The main construct into the social cognitive theory is "***perceived self-efficacy***". Perceived self-efficacy "refers to beliefs in one`s capabilities to organize and execute the courses of action required to manage prospective situations" (A. Bandura, 1995). Self-efficacy involves judgments about personal capabilities to undertake certain tasks (B. Zimmerman, 1995). The essential impact of self-efficacy determines the way people think, feel, motivate themselves, and act. Additionally, it also impacts on those strategies deployed for the consecution of goals (E. Locke, Frederick, E., Bobko, P., and Lee, C., 1984; E. Locke, Saari, L., Shaw, K., and Latham, G., 1981). I will carefully look into goals later on since this impact on learning strategies is –hypothetically- relevant for our entrepreneurial field.

In the face of troubles, pressures and taxed situations, and when –as always happens in entrepreneurial settings- things go wrong or below expectations, some individuals will persist in their endeavors even though failures and setbacks happen at the early stages. At the contrary, other entrepreneurs will decline to invest additional effort, will not persevere and will reduce their expectations. But, how does this process work through individuals?

How self-efficacy operates to affect performance

To understand successful performance and the impact of self-efficacy on performance, we have first to review some findings about self-regulation processes that will help us to understand the way self-efficacy operates in this process. What characterizes successful performance is a *self-regulation process of personal behaviours*. For Flammer (1995) "to believe in one's own control means to self-consciously know that one is able to act in such a way that certain effects are produced". He added that control beliefs are personal constructs built during lifetime. Three main behaviours are essential to be self-regulated by individuals (A. Bandura, 1993, 1995): Motivation; disruptive thought processes; and, aversive emotional reactions.

Motivation is the first behaviour to be self-regulated. Efficacy beliefs are central in self-regulation of motivation (A. Bandura, 1995). Self-efficacy plays an important role in human

behaviour because is precisely concerned with the *activation* and *persistence* of those human behaviours (A. Bandura, 1977). This author also stands out the benefits of "optimistic efficacy beliefs" to confront realities that might be rather difficult and stressful as entrepreneurship is. For example, realist individuals would adapt properly to task situations but those with a powerful sense of personal efficacy are able to change those realities. Theoretically, these optimistic efficacy beliefs might be essential for entrepreneurs and its developing would turn up a useful training tool *ex ante*. Ultimately, whether individuals pretend to develop a stronger sense of personal efficacy they must work through their ability to influence their motivation and behaviour, and this is basically done through self-regulation (A. Bandura, 1995).

The second behaviour to be self-regulated is disruptive thoughts (A. Bandura, 1995). As mentioned previously, thought processes play a central role because they allow humans to foresee future events, to set goals and to design courses of actions oriented to achieve desired outcomes. This process triggers the needed effort that individuals must exert to succeed in their endeavors (A. Bandura, 1995). This is a solving-problem mechanism which requires effective cognitive processing of information (A. Bandura, 1995). Self-efficacy impacts the quality of such a solving-problem function. Low sense of personal efficacy might easily lead to erratic thinking which will be translated into poor performance under taxed circumstances (R. Wood & Bandura, 1989). At the contrary, high self-efficacy perceptions allow subjects to persist in their challenges, maintain their goals, and thus, execute higher performance due to the use of a good analytic thinking (A. Bandura, 1995). Again, "right" analytic thinking is –theoretically- essential for increasing chances to succeed in entrepreneurial settings.

The third behaviour to be self-regulated is aversive emotional reactions (A. Bandura, 1995). At this regard, for example, bad mood may also have a negative impact in control beliefs, and –therefore- its self-regulation is critical. This is because we can observe a serious cycle: failure triggers disappointment and, consequently, produces bad mood. Bad mood makes failure even more salient. The main consequence is a permanent attitude to avoid those challenges which –in the past- produced these failures, making the chance of future failures even greater –since practice is lower after failure. It is a vicious cycle (Flammer, 1995) that should be avoided.

Self-efficacy and sources of motivation for action

A. Bandura (1977) identifies two sources of motivation for actions. The first one is the cognitive process of representing future outcomes. The second source operates through setting goals which –consequently- generates a self-evaluative reaction depending on the grade of fulfillment of those goals (namely, success or failure according to expectations). At this regard, A. Bandura (1977) and R. Wood and Bandura (1989) break down this evaluative process into two different ones.

First, subjects determine goals and performance standards in advance. Once the action is performed and results become facts, individuals undertake a *self-evaluative process*. "***Discrepancy reduction***" (A. Bandura, 1996; R. Wood & Bandura, 1989) involves a negative-feedback due to dissatisfaction. Therefore individual is motivated to make changes in behaviour. For instance, where actual performance is below expectations subjects do reparative-actions (toward a "discrepancy reduction") oriented to increase performance or, otherwise, reduce their expectations.

Secondly, **"discrepancy production**" (A. Bandura, 1977; R. Wood & Bandura, 1989) is the process through which individuals *set themselves*, proactively, challenging goals *in advance* based on their perceived sense of capability. The essential difference between the both is that the latter is not determined by the perception of failure in the consecution of pre-existent goals, and therefore, *anticipated satisfaction alone* offers incentives for action (feedback is not mediating the process) (A. Bandura, 1977).

Relevant previous findings on Self-efficacy

Self-efficacy has been tested out in several fields that may perfectly be perceived as similar with entrepreneurship, and whose challenges and learning demands are quite similar. Hypothetically, their findings might be assumed to be valid in entrepreneurship as well. For example, relevant implications of the importance of self-efficacy have been tested out in education (Anderman, 1997; C. S. Dweck, 1986; D. Schunk, and Rice, J.M., 1989; B. Zimmerman, 2000); science/engineering major studies (Lent, 1986); effect of failure and success of perceived similar peers (A. Bandura, & Jourden, F. J., 1991; I. Brown, Jr., & Inouye, D. K., 1978) athletic performance (A. Bandura & Locke, 2003; Kane, 1996); career

choice (A. Bandura & Locke, 2003; Betz, 1997; G. Hackett, 1995) and control beliefs (Flammer, 1995).

Among the conclusions, for instance, students with a low perceived self-efficacy avoid demanding tasks (A. Bandura, and Schunk, D., 1981). In the research by Chwalisz (1992), for instance, the authors worked with teachers and found that those with higher level of efficacy beliefs faced academic stressors by *focusing on solving them* while the low self-efficacy teachers showed a "pattern of escapist" by avoiding dealing with troubles.

Parallel, for the case of students, those with high self-perception of efficacy were better monitoring their working time, more persistent, less likely to reject hypothesis *prematurely*, and better at solving conceptual problems when compared to students of *equal ability* but lower perceived efficacy (Bouffard-Bouchard, 1991).

Self-efficacy has likewise shown to be a good predictor of performance in cross-cultural context as for example, in the case of Klassen (2004) work with Indo Canadians and European Canadians. However, despite the effect of perceived efficacy in the both groups, Klassen found that self-efficacy was insufficient to explain alone performance in the case of Indo Canadians. He suggested the possibility that cultural differences related to individualism versus collectivism orientations (Hofstede, 2004) might play a role and, therefore, making self-efficacy approach hypothetically more valid in individualism-oriented societies. Contrary, (Earley, 1993) found that self-efficacy was indeed a good predictor for working environments and for individuals of the both cultural orientations: collectivistic and individualistic.

Self-efficacy also seems to play a role in gender career choices; in fact, efficacy beliefs regarding occupation choices were more important predictors for female school students than for male ones (G. Hackett, 1995). It is also interesting than high socio-economic status female students showed higher efficacy beliefs and were more prompted to consider non-traditional careers -namely, engineering, sciences and "male" choices in general (G. Hackett, 1995). G. Hackett, & Betz, N. E. (1981) held that career efficacy beliefs were more important than interests, values, and abilities in the observed restricted pattern that women made career choices.

PART 4: THE SECOND CONSTRUCT, PERCEIVED PERSONAL GOAL ORIENTATION

As we have seen, self-efficacy might come up with a sort of explanation, at least partially, for the entrepreneurial phenomenon researched on this thesis. Individuals might fail because of lack of the necessary competencies and skills required for performing well a certain activity. A second explanation is that individuals fail because they lack self-beliefs related to their capabilities to use their skills and knowledge (already existing) in an *effective way*.

However, this is not the only possibility. The nature of the goal-learning orientation in the individual and in his or her environment may likewise affect performance outcomes. Hypothetically, those goal orientations might determine how effective the required-learning strategies on entrepreneurial settings are. For instance, Anderman (1997) and B. Zimmerman (2000) added that even though skills may be lacked, self-efficacy might be increased by focusing on learning approaches which orient their actions to provide –*first*- those required skills and knowledge (learning strategies), and –*second*-, to motivate individuals to use those new skills and knowledge more intensively and effectively (that motivation is due to self-efficacy).

Relevant findings suggest that more efficacious people set themselves higher goals for the tasks they are undertaking (E. A. Locke & Latham, 2002). Additionally, harder goals increase performance (G. P. Latham, & Locke, E. A., 1975; E. Locke, Saari, L., Shaw, K., and Latham, G., 1981; Yukl, 1978; B. Zimmerman, and Ringle, J. , 1981), and hard goals work better than vague ones or such a goals as "do your best" (E. Locke, Saari, L., Shaw, K., and Latham, G., 1981). The reason behind is that goals work as a *motivational mechanism* that determines how much effort to use, how much persistence to put on (how long the effort will be deployed), direction of that effort, (indirectly) development and selection of strategies (E. Locke, Saari, L., Shaw, K., and Latham, G., 1981; R. Wood, & Locke, E., 1990; B. Zimmerman, and Ringle, J. , 1981); and proficiency of those strategies (R. Wood & Bandura, 1989).

In this project, I will focus my attention in the fact that goals are related to the type of learning orientation that individuals show. In other words, I am meaning that goals and learning

strategies are defined through the kind of goal orientation shown by the individual and the environment. Anderman (1997) explain the difference between two basic types of goal orientation: ***performance goal orientation*** (PGO) and ***task goal orientation*** (TGO). The former orientation understands *ability as fixed*, and failures as a sign of personal deficiencies. The latter adopts a learning approach where personal capabilities are understood as in *permanent progress*, and personal focus is on identifying what causes problems and how to master those tasks required for implementing solutions. These two goal orientations will be analyzed in detail in this research.

Goal orientations and individual's implicit theories

These two different goal orientations may be understood from the perspective of *implicit theories*. Implicit theories "refer to the two different assumptions people may make about the malleability of personal attributes"(C. S. Dweck, Chiu, Ch., & Hong, Y., 1995). According to this, individuals understand intelligence –for example- either as a fixed entity or as malleable quality. Thus, fixed-entity individuals will understand their set of capabilities as a fixed function of their *current* potentialities. To some extent, we might suspect that those individuals (with a fixed understanding of their capabilities) will show a lower level of control over the facts impacting their lives. Conversely, "malleable-approach"-individuals understand their present capabilities as potentially *improvable*, and thus, these individuals would tend to exert greater effort to develop further their set of skills and knowledge.

Consequences in terms of goal orientation are worth mentioning. For entity-theory individuals "the self would be conceptualized as a collection of fixed traits that can be measured and evaluated". For the case of "malleable" perspective, "the self would be seen as a system of malleable qualities that is (are) evolving overtime through the individual's efforts" and, therefore, intelligence and any other personal attribute is essentially understood as malleable and expandable" (C. Dweck, & Leggett, E., 1988). Additionally and more interesting, some evidence suggests that fixed entity approach is behind individuals with PGO, while the malleable approach is closely related to TGO individuals (C. S. Dweck, Chiu, Ch., & Hong, Y., 1995).

Goal orientations and the effect of feedback

It is also important to understand the *"attributional feedback"*. Attributional feedback is what individuals attribute as *the ultimate reason* of success and failure. Some evidence in the literature pays attention toward *effort as a critical factor* that would be interpreted differently depending on individuals' goal orientations.

The PGO-subject interprets effort as a sign of *lack of ability*. The greater the effort required the lower ability. As a necessary consequence, for the PGO pattern, new challenges represent a threat to self-esteem, since the ultimate result depends on –inexorably- whether skills and knowledge are *already* present or not. Again, we observe the influence of fixed approaches: if skills and knowledge are fixed, effort is not a key player in the equation, and –consequently- no learning strategies are required (since ability is already available).

The TGO-subject conversely considers effort as a *necessary mean or strategy* to obtain the ability required to master new tasks. Thus, before failure, TGO individuals would tend to increase effort and ingenuity (C. Dweck, & Leggett, E., 1988). As already mentioned, TGO-individuals understand their already set of ability as something "changeable" due to personal actions. This personal control necessarily involves effort, and –in consequence- learning strategies play an essential role to make the acquisition of new skills and knowledge successful.

As a practical derivative, comparative feedback -comparison to others (a PGO characteristic)- is less likely to produce an upward goal revision or "discrepancy production" (ability to proactively set higher goals in advance) than nominal feedback -comparison to one`s performance (a TGO characteristic)- (Ilies, 2005).

This is not difficult to understand since PGO-subjects would tend to see reality in a more "fixed way". This trend would make subjects to accommodate challenges to their current "level of ability", and future goals and expectations would be closely related to their present level of skills and knowledge. This set of capabilities certainly may not be simplify as entirely fixed but even though PGO-individuals certainly learn, this learning strategies and learning potential is –comparatively- more limited that its TGO-counterparts. TGO-individuals would

trend to set expectations and goals beyond the borders of their present situation since skills and knowledge are ultimately perceived as "essentially malleable".

An additional and final point to be analyzed is the importance of personal feedback. This is quite different from the "attributional feedback" since performance feedback is more context-based and, basically, tells us how well and badly we are doing. Performance feedback predicts goal regulation according to Ilies (2005). For example, when good feedback was provided leaded to setting of subsequent higher goals, and perception of progress toward self-set goals is an important source for pulling up self-efficacy (A. Bandura & Locke, 2003; D. Schunk, and Rice, J.M., 1989).This constitutes a useful finding. If we remember, setting of higher goals would lead to an even further greater performance, and would have the ability to also impact self-efficacy perceptions (which also impact future performance). Performance feedback would show –hypothetically- a double impact over goals and self-efficacy, and it would arise as a potential "changing mechanism". However, results are not conclusive at this regard.

This goal progress –positive feedback- is also associated to positive affects (Alliger, 1993). In fact, positive affect mediated a significant proportion of the within-individual relationship between feedback and goals (Ilies, 2005). This means that positive affect would change personal attitudes toward future challenges, affecting –just to speak- the level of Bandura's optimistic realistic perception. However, results are not conclusive. Contrary to C. S. Dweck (1986), Anderman (1997) and (Ilies, 2005), Redlich (1986) found that when "attributional feedback" relates success to ability, *students did show* an increased perceived self-efficacy and academic attainment. D. H. Schunk (1987) has demonstrated that feedback attributing success to effort impacts positively motivation and self-efficacy for further learning, however, *he also found* that comparative social feedback -read PGO orientation- *did stimulate* personal efficacy, skill acquisition and performance. Additionally, frequency and immediacy of this feedback also impacts on self-efficacy beliefs (D. H Schunk, 1983).

It is also worth mentioning the effect of a related-concept as *reward* over efficacy perceptions. According to some findings, reward would be a negative tool because might negatively impact efficacy perceptions depending on whether or not is *contingent with* previous achievements (Flammer, 1995). At this regard, for example, at raising efficacy beliefs through evident-easy tasks impacts positively on younger students but negatively on older students

and adults (Flammer, 1995). Additionally, in the context of school learning when feedback is more systematic, emphatic, differentiated, and public, the greater would be its *undermining impact* (Flammer, 1995). It is an interesting discussion; however, in this project, I will not have the chance to test out these findings but they all are worth being taken in consideration to understand properly the way self-efficacy, entity theories, goal orientations, and strategies are related to performance outcomes.

How goal orientations and self-efficacy are related to each other

These cognitive differences (TGO versus PGO, fixed versus malleable approach) are essential to understand the way different individuals will face taxed situations and setbacks. Those differences will determine individual expectations of future actions and the extent to which they can determine and influence the outcomes of those actions.

So, theoretically, self-efficacy would be related to the capacity to alter individual perceptions about how fixed or malleable personal attributes are. In this research, I will suggest that actually self-efficacy is affected by the type of goal orientation (TGO or PGO) that individuals show. These personal goal orientation might impact on the expectations (and outcomes) related to future actions and events. A core ability to exert a greater level of control over those future outcomes is given by learning strategies required to overcome entrepreneurial challenges and demanding situations in general. As we could see in the self-efficacy section, those more effective learning strategies get focused on acquisition of new skills and knowledge when situation demands new personal attributes. A greater focus on acquisition of new skills and knowledge would be related to a conception of personal attributes more in line to malleable approaches and thus to TGO. Since the greater the perception of a changeable personal set of skills and knowledge (TGO), the greater the belief in that personal actions can –certainly- impact those set of personal attributes (efficacy beliefs). The greater this conviction (efficacy beliefs), the greater the real impact produced by learning strategies and –subsequently- greater the outcomes derived from those learning strategies.

These two approaches (TGO and PGO) might be pictured through two different questions. In the case of fixed entity (PGO), subjects would show greater identification with: *Is my ability*

inadequate or adequate for this task? Meanwhile, for the case of people identified with a malleable approach (TGO), the question would be as: *What is the best way to increase my ability to achieve mastery?* (Chiu, Hong, & Dweck, 1997). To conclude, strategies are regarded as more useful and, subsequently, individuals are more willing to use them if those strategies are perceived as valuable instruments to boost performance (D. Schunk, and Rice, J.M., 1989). Emphasis on strategy learning has in fact been observed to improve task involvement among students, for example (D. Schunk, and Rice, J.M., 1989).

Relevant previous findings on Goal Orientation

Let's come back on PGO and TGO orientations. The important thing is that task goal orientation (TGO) is associated to better adaptive patterns of behaviour, cognition and affect (Anderman, 1997). In terms of self-efficacy perceptions, the TGO potentiate personal efficacy perceptions through developing and setting of learning strategies and goals (A. Bandura, 1988; Seijts, 2005).

At the contrary, PGO undermines perceived self-efficacy, and therefore, performance. Some evidence in the context of students learning suggests, for example, that PGO would be especially negative for students of low-perceived ability (Anderman, 1997; C. S. Dweck, 1986). More dramatically, PGO is not beneficial if situation actually requires the acquisition of some knowledge and skills. This is because performance is a function of ability and motivation, consequently, in certain circumstances, establishing primary learning goals would turn into increasing ability and, *only afterwards*, PGO would result effectively in motivating greater effort and persistence (Seijts, 2005). This finding is especially valuable in our context of entrepreneurial settings since many of the tasks and challenges that entrepreneurs face along the way may be considered "new".

In the same direction of these findings, (C. Dweck, & Leggett, E., 1988) held that individual's goal preference predicts pattern of learning. Thus, TGO –or as they named it: "mastery-oriented pattern"- would be related to positive features such as self-instructions, self monitoring, positive affects, and effective problem-solving strategies. The PGO ("helpless pattern") was also pointed out as a maladaptive pattern of behaviour.

In research of children learning, some evidence concluded that when acquisition of skills is the main orientation (TGO), present ability turns out irrelevant (C. Dweck, & Leggett, E., 1988) and does not predict confidence for future attainments (A. Bandura, 1995). This comes to reinforce our previous discussion about the impact of "malleable approaches" on development of learning strategies and goal orientations, and their subsequent impact over performance. The ultimate factor that students identify as the reason of success and failure will determine expectancies of future attainments (B. Zimmerman, 1995). Gist (1992) referred to this ultimate factor as the "*attributional feedback*", already analyzed in a previous section.

Part 5: The third construct, perceived environment goal orientation

The effect of environmental characteristics is also worth mentioning. Perceived environment goal orientation is closely related to personal goal orientation since the environment can also be described as performance-oriented or as a task-oriented environment. However, even though closely related to each other, they are not the same construct and can in fact show different impact on performance and on self-efficacy. Theoretically, independently of the personal goal orientation, the kind of goal orientation of the environment might play a role of a sort of moderator, mainly for those individuals exhibiting maladaptive patterns (C. S. Dweck, 1986). At this regard, in studies with children, some evidence suggests that the way environment is perceived (TGO or PGO) impacts perceived self-efficacy, and perceived self-efficacy successively impacts the way children set goals for themselves (B. Zimmerman, Bandura, A., and Martinez-Pons, M., 1992) and their reactions toward their performances (B. Zimmerman, 1995).

It has also been found that less able individuals would be more vulnerable to the way environment – and its agents- affect self-efficacy perceptions. Concretely, Oettingen (1995) explored the differences observed between East-German and West-German students. He found that contextual differences which impacted the emergence of self-perceptions of efficacy affected to less intelligent students only. Those less-smart children showed lower perception of capability to exert effort, believed to be less smart, attract less luck, and to attain less help of their teachers. Those differences emerged in third grade and lasted for the rest of

the school life. At this regard, teacher was the most important agent to transmit this process (Oettingen, 1995).

Additionally, evidence shows that strategy instruction is especially fruitful in increasing self-efficacy for students experiencing problems (D. Schunk, and Rice, J.M., 1989), or for low-ability students (Anderman, 1997; C. S. Dweck, 1986). Consequently, as shown, the kind of environment seems to be critical, especially for those individuals described as more "vulnerable". In theory, those vulnerable subjects would show a PGO-orientation, and the environment might contribute to mitigate the negative effects on self-efficacy and performance, or, at the contrary, to increase them.

The high-performance cycle

All those previously described mechanisms (goal orientation, self-efficacy, learning strategies, attributional feedback) lead to the so called "high-performance cycle" (E. Locke, and Latham, G., 2002). The *"high-performance cycle*" starts by setting high goals and those goals lead to higher performance. Higher performance turns into rewards (i.e., recognition, promotion, more money, etc), which provide satisfaction and enhance self-efficacy perceptions, and by so doing, a progressively setting of *even higher goals*.

It is a simple process. However, if we look at the variables inside this cycle we can see a broad picture of how this performance equation actually works and all the details involved in it. For example, how high goals will be set is –as seen- depending on current self-efficacy perceptions and personal beliefs about how malleable personal attributes are (personal goal orientations). If personal orientation is more according to a belief of a malleable development (TGO), goals will be set to a higher level, more related to personal expectations than to current level of skills and knowledge. Alternatively, if what we observe is a more fixed orientation (PGO), then individuals would implement to a greater extent goals and strategies *merely oriented to reach the already existing level of capability*.

If skills and knowledge are not –currently- available, then learning strategies will become critical for the consecution of desired outcomes. Goal orientation is closely related to how malleable we perceive attributes. The more we are oriented toward to a nominal comparison, namely: to improve according to our own previous outcomes (TGO), the more focus on

implementing learning strategies and more willing to accept new challenges (which require acquisition of a new set of capabilities). Environment goal orientation would play a moderator role for those individuals exhibiting a PGO-pattern, as long as the environment is TGO-oriented. There is no evidence that environment would impact on TGO-individuals. The effect of the environment goal orientation on self-efficacy would be through learning strategies by promoting more effective ones, and also I expect to find a direct effect on performance.

Self-efficacy –hypothetically- is impacted by individuals' goal orientations, the environment goal orientation, and the learning strategies deployed by individuals. Self-efficacy would be potentiated by a TGO goal orientation (and slowed down by a PGO orientation) as a personal level as an environmental level (TGO-oriented environment). Self-efficacy will also be potentiated by deployment of more effective learning strategies, and through these impacts, will determine higher performance outcomes. The specific effect of learning strategies will not be studied on this research, but the effect of personal goal orientations (TGO or PGO) will be indeed.

Part 6: Model specification

In the literature review section of this research, I have reviewed in detail the three main theoretical constructs: perceived self-efficacy, perceived personal goal orientation, and perceived environmental goal orientation. To the purpose of gaining a better understanding of results and explore practicalities of the model, I have divided the analysis of perceived personal goal orientation into two separate constructs.

Two models: TGO and PGO: Why?

As mentioned, I will separate the personal goal orientation into two different constructs. First, "Task Goal Orientation" (TGO) widely identified in the previous section, and "Performance Goal Orientation" (PGO), also widely studied. In practical terms, the former is analyzed using the first four questions of the construct identified as perceived personal goal orientation; and, the latter is identified with the last three questions of identical construct.

The reason for doing so is that the both constructs refers to two different orientations that, in part, are contradictory according to some literature. One alternative, it would have been to build a "*net*" personal goal orientation, based on the findings suggesting that PGO is a maladaptive pattern, and where PGO values were reported on negative terms (-1,-2, and so on), while -10, the maximum PGO-value for personal orientation, were at the same time the worst scenario. However, since it is also my interest to test out this finding (PGO as a negative thing) in entrepreneurial settings, I have made the conservative decision of analyzing them separately, and by so doing, test out the independent and separate effects of TGO and PGO on self-efficacy and on performance. Once obtained all the results, I might say if there are significant reasons to sustain that PGO is impacting negative self-efficacy and performance as suggested by some literature, and that TGO is impacting self-efficacy and performance positively.

Formal specification

One of the main advantages of using SEM is that accounts for the measurement error (T. A. Brown, 2006). The estimation goal is to minimize differences between the observed and implied covariance matrices. A priori specification of the models to be tested out is as follow. The first model is working with TGO (TGO-Model), and the second model uses PGO (PGO-Model). Pattern of expected relationships are identical in the both cases (using TGO and PGO), except for one single difference: effect of PGO on self-efficacy and perceived performance is expected to be direct and *negative* as suggested by the literature review, meanwhile the effect of TGO is expected to be direct and *positive* on those variables. It is also expected an *indirect* effect of TGO/PGO on performance mediated by self-efficacy. Identical pattern is expected for the perceived environmental goal orientation: *direct, indirect (mediated by self-efficacy), and positive effect on perceived performance and on self-efficacy*. Regarding self-efficacy, I expect a *direct and positive relationship on the Perceived Performance construct*. All the relationships are designed to follow what I have found in the regarding literature. The purpose, then, is to find out whether those relationships are also valid for the entrepreneurial ecosystem as defined previously.

For the case of this research, I have defined four Latent Variables (LV): Perceived Personal Performance (Per_Perf), Self-efficacy (Se_eff), Task Goal Orientation (TGO), Performance Goal Orientation (Per_PGO), and Perceived Environment Goal Orientation (Per_EGO).

Additionally, 27 Observed Variables (OV) have been defined to measure each of the constructs pointed out previously. For the case of Self-efficacy, there are 12 OVs (Se_eff_1 to Se_eff_12); 4 OVs for TGO (Per_TGO_1 to Per_TGO_4); 3 OVs for PGO (Per_PGO_5 to Per_PGO_7); 5 OVs for Environment Goal Orientation (Per_EGO_1 to Per_EGO_5); and, 3 OVs for Perceived Performance (Per_1 to Per_3).

Perceived Personal Performance and Self-efficacy are LV-dependent variables or endogenous. TGO, PGO and Perceived Environmental Goal Orientation are LV-independent or exogenous variables.

The all four constructs identified as the Latent Variables of this study are reflective factors which ***load on*** their indicators (questions in the survey) a part of the construct. Under this definition, each question should reflect (in part) something of the main Latent Variable (LV) (Shah, 2006), which is expressed by the respective factor loading.

Models are shown in Figures 1 and 2. Ovals represent the four constructs (TGO/PGO, Self-efficacy (Se_eff), Environment Goal Orientation (Per_EGO), and Perceived Performance (Per_Perf), and rectangles represent the indicators or questions of the survey which were used to measure each of the latent constructs. Arrows from the latent variable (factor) on the indicators represent the “factor loadings” and the ones connecting factors one to another are the “structure coefficients”. Small circles represent the respective measurement errors of the SEM model.

Figure 1: SEM Model with TGO

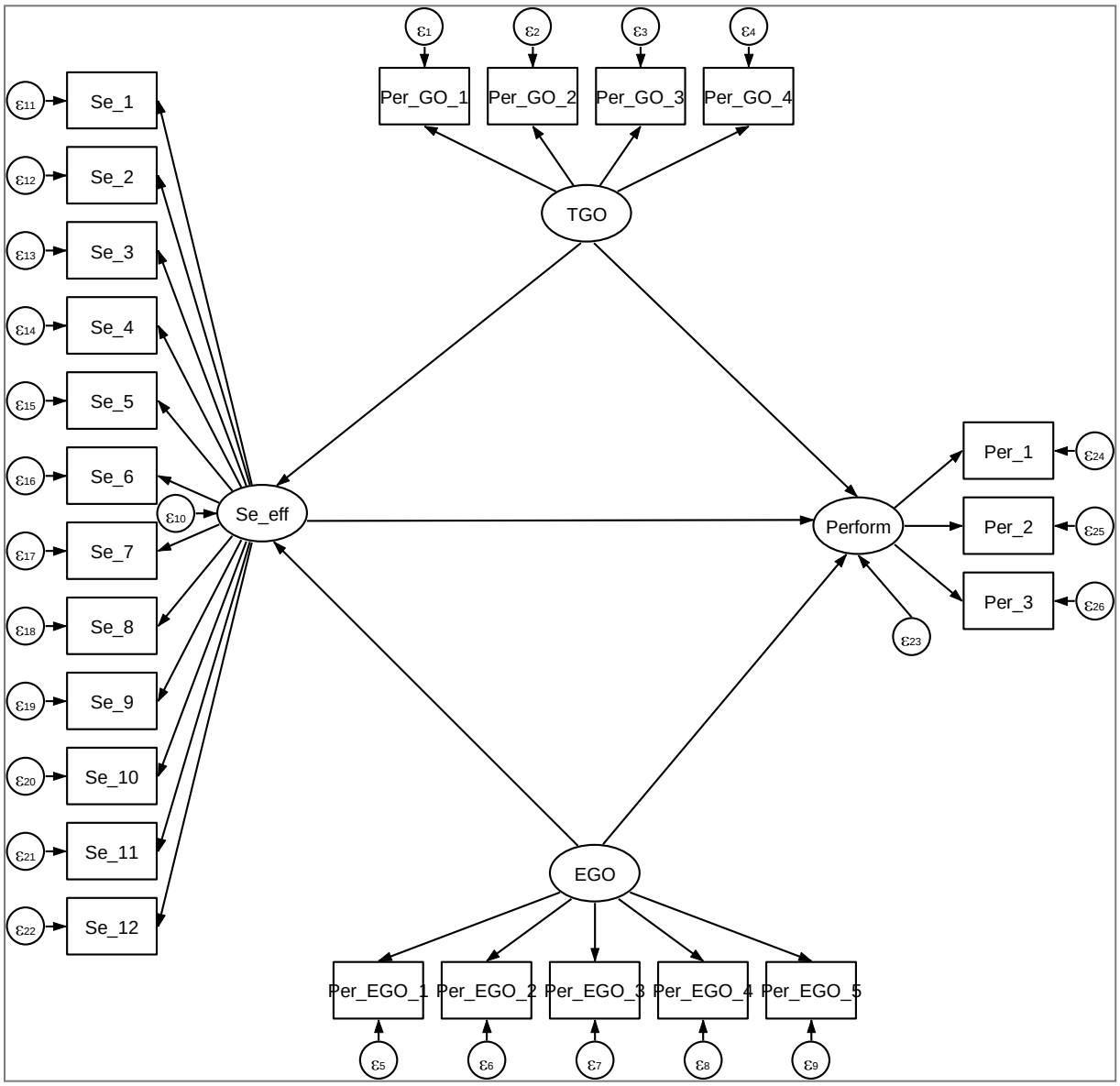
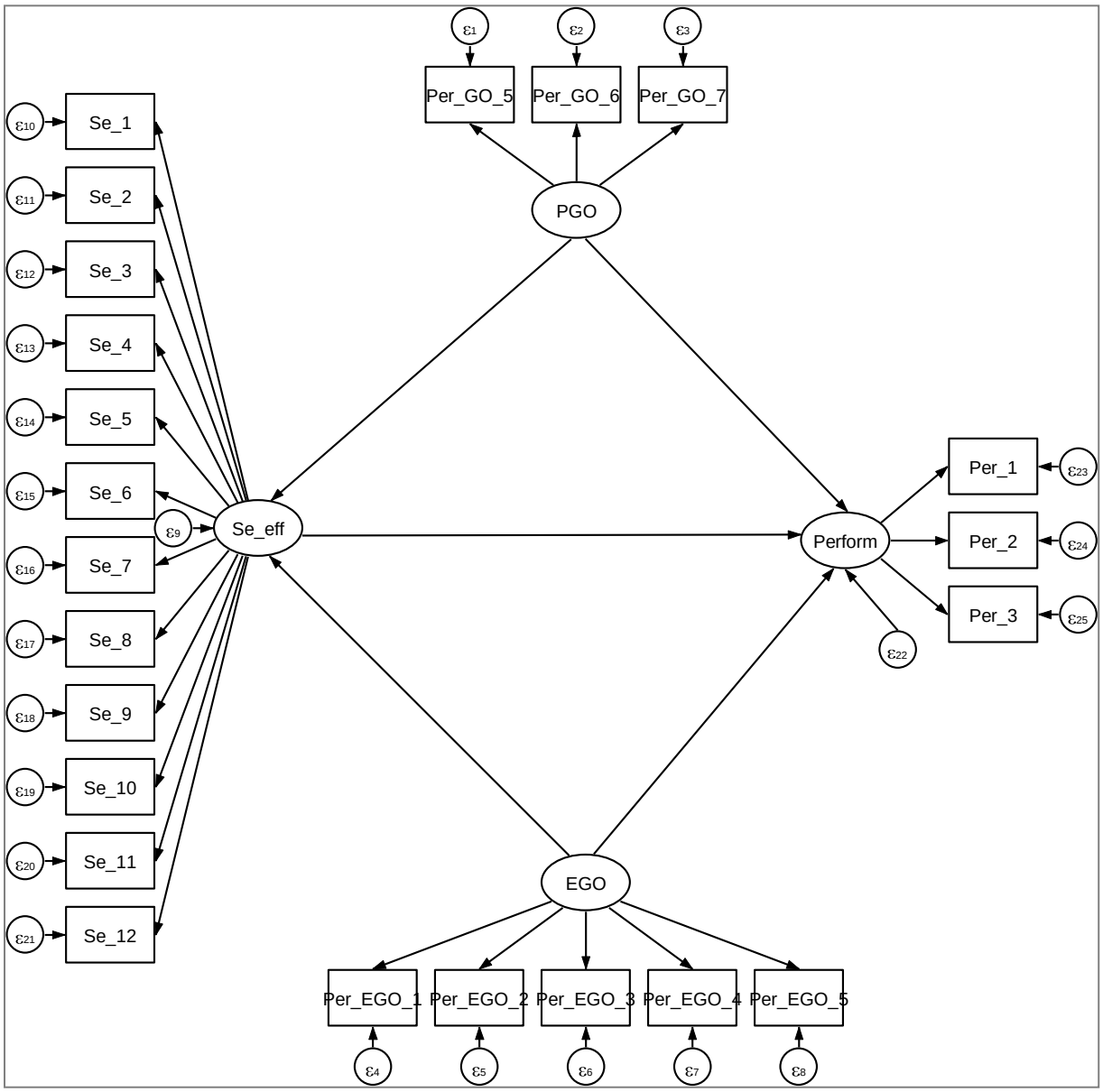


Figure 2: SEM Model with PGO



Formal meanings of the relationships of the two SEM models

The formal meanings of the relationships described in the Figures 1 and 2 are important to be explained in detail. For example, for the case of the model-TGO, we have described several different relationships. For example, let's look at that Environment Goal Orientation (EGO) and its link to Performance. Parallel, Performance also loads on three different indicators. This means that EGO is supposed *to predict* performance, while performance is supposed *to be measured* by the aforementioned three indicators (observed variables). Mathematically, there are two types of relationship that I should specify and explain for each of the

relationships. They can be expressed as follow for the case of Perceived Environmental Goal Orientation and Perceived Performance (Schumacker, 2004): Performance can be defined as a function of Perceived Environmental Goal Orientation (EGO), since EGO is the independent variable (explanatory) and Perceived Performance is the dependent variable (explained). This function can be described as follow:

$$\boldsymbol{Performance} = (\boldsymbol{Structure\ coefficient}) * (\boldsymbol{Per\ EGO}) + \textbf{ Prediction Error}$$

The prediction error represents the portion of Performance that is not predicted by the latent variable "Perceived Environment Goal Orientation" (Schumacker, 2004). This relationship is expressing the relationship between two latent variables and it is part of the structural model.

The rest of the functions for PGO, TGO and Self-efficacy, which are part of the structural model, can be described as follow:

$$\boldsymbol{Performance} = (\boldsymbol{structure\ coefficient}) * (\boldsymbol{PerPGO}) + \boldsymbol{\ Prediction\ Error}$$

$$\boldsymbol{Performance} = (\boldsymbol{structure\ coefficient}) * (\boldsymbol{PerTGO}) + \boldsymbol{\ Prediction\ Error}$$

$$\boldsymbol{Performance} = (\boldsymbol{structure\ coefficient}) * (\boldsymbol{Selfefficacy}) + \boldsymbol{\ Prediction\ Error}$$

The second relationship to understand is which relates the latent variable to its observed variables (indicators represented by the questions in the survey). This relationship can be expressed as follow for the case of the indicator 1 into the Perceived Performance construct, *"Per_1"* (Schumacker, 2004).

$$\boldsymbol{Performance} = (\boldsymbol{Factor\ Loading_1}) * (\boldsymbol{Per\ \ 1}) + \boldsymbol{\ Measurement\ Error_1}$$

$$Performance = (Facto\ Loading_2) * (Per2) + \ Measurement\ Error_2$$

$$Performance = (Factor\ Loading_3) * (Per3) + \ Measurement\ Error_3$$

The Measurement Error is the portion of variance not explained by the regarding latent construct -Performance in the example- (Schumacker, 2004). This equation, therefore, is expressing the relationship between the latent variable and its observed variables, and it is part of the measurement model.

Identical pattern should be followed to express all the functions. I will only show the equations for the respective questions "1_s" in each of the latent variables. Identical description is followed for the rest of the indicators in each constructs (12 indicators for self-efficacy, 3 for PGO, 4 for TGO, and 5 for EGO).

$$Self - efficacy = (Factor\ Loading_1) * (Selfeff1) + Measurement\ Error_1$$

$$PerPGO = (Factor\ Loading_1) * (PerPGO1) + Measurement\ Error_1$$

$$PerTGO = (Factor\ Loading_1) * (PerTGO1) + Measurement\ Error_1$$

$$PerEGO = (Factor\ Loading_1) * (PerEGO1) + Measurement\ Error_1$$

Part 7: Methodology

Sample description

This research was implemented in online basis. Collection method involved a non-random and convenience-driven sample. A questionnaire shown in the Appendix section was uploaded on the webside Questback, on the Internet address: https://response.questback.com/rodrigofigueroa/nc25kbxm52/. This survey was strongly promoted on LinkedIn professional groups whose languages were English and Spanish, and whose main theme was entrepreneurship or start-up.

This questionnaire was made up of 31 questions compounded by 4 demographic questions, 12 related to Self-efficacy, 7 to Perceived Personal Goal Orientation (4 for Task Goal Orientation-TGO; and 3 for Performance Goal Orientation-PGO), 5 to Perceived Environment Goal Orientation (EGO), and 3 to Perceived Personal Performance.

This sample attempted to be representative of an international community of entrepreneurs, highly globalized and interconnected through use of Internet, highly educated, and active members of what is known as "start-up environment". Sample is neither restrictive to any industry nor geographical location in particular, and its main purpose was to set up some *behavioral patterns* of international and globalized entrepreneurs. Since this was a quite advantageous way of getting access to entrepreneurs from all over the world, parallel implies some problems in the extent of generalization for this research. Results should be carefully taken since they might turn out being hardly applicable on different settings (Bentler, 1987).

After one month online (from April 15th to the May 12th), this survey was completed with 106 respondents. No missing data is reported for none of the variables. Among the sample, 72% were males while 28% females (Appendix 1).

To report age, I have created ten different age ranges from 15 to 20, 21 to 25, and so on, until the final range was greater or equal to 61 years old. The age ranges that accounted for most of sample's respondents were 31-35 (18%), 36-40 (12%), 41-45 (15%), and 51-55 (13%). Entire distribution of age respondents was as indicated in Appendix 2.

Distribution of level of education indicated that 5% reported Secondary school, Undergraduate level (48%), Master/MBA graduate (8%), PhD (8%), and Other (31%). Distribution of level of education is shown in Appendix 3.

This number in responses was a bit lower than the minimum expected *ex ante.* According to (Anderson, 1988), a minimum sample size should be around 150 to obtain estimates that have standard errors small enough for the analysis. However, degrees of freedom in the testing model are also relevant to determine the right sample size for the study (MacCallum, 1996; Shah, 2006).

Nationality of respondents was highly diverse with 37 different reported nationalities. Nationality diverse sample was a convenience choice. Since this project is measuring *behavioral constructs* of highly-globalized entrepreneurs, I have decided that nationality is not a variable under research. Even though, cultural features may eventually impact on the independent variables, that cultural effect is beyond the scope of this research, and my entire focus is on identifying those behavioural patterns that can explain differences on perceived

performance on entrepreneurial settings. Priority was in getting as many respondents as possible to offer statistically-acceptable results. This convenience choice should be taken into consideration once discussing results of this research.

Procedure description

The two previous models will be tested out using SEM (Structural Equation Modeling). The entire procedure is described as following:

- First, I will describe the formal assumptions required for a good implementation of SEM. I will point out which of those assumptions are fulfilled and which are not. When required I will explore consequences for the results if assumptions are not fulfilled and which procedures were followed to mitigate its negative incidence.
- Second, I will analyzed convergent reliability through Cronbach's alpha for each of the relevant construct: Self-efficacy, Perceived Personal Goal Orientation (TGO and PGO, separately), Perceived Environmental Goal Orientation and Perceived Personal Performance.
- Third, I will run Factor Analysis for additional divergent reliability analysis. Factor analysis should provide insight about the number of constructs (or factors) that are underlying in our survey (in the last 27 non-demographics questions). Additionally, I will run Factor Analysis on each construct separately for additional evidence of convergent validity of each construct. Points 2 and 3 may also be regarded as a part of the measurement model testing since they constitute evidence of how well relationships between factors (latent variables) and indicators (observed variables) have been specified and work through (Schumacker, 2004).
- Fourth, I will run SEM using Stata 12 software program. I will analyze all the findings shown in the model and their statistical significance, I will show different fit indexes to test how well (or bad) this model fit the data, and, finally, I will show modification indices to explore possible changes in the specification of the model that might – eventually- increase its goodness of fit .
- Sixth, I will discuss my results and its generalization and applicability in the next section.

Measures

To the purpose of offering five highly reliable constructs, I have based my questionnaire on two measurement instruments. The first measure was designed by A. Bandura (2006), which is measuring self-efficacy; and, the second measure designed by Anderman (1997), which is used to measure personal goal orientation (TGO and PGO), and Environment Goal Orientation (EGO).

I have also followed some recommendations pointed out by Sudman (1996), which are oriented to ensure high quality in responses. First, this questionnaire was tested out first, in a preliminary way, to see in advance possible problems related to interpretation and clarity. Secondly, every question has been changed in their "wording" in a way that can interpret in a proper way what entrepreneurs use to deal with everyday and represent specifically what entrepreneurship is. Thus, I have reduced likelihood of emergence of context effect at a comprehension stage. Third, introduction to the questions and to the questionnaire has been worded in a way that was tested as neutral to avoid "response effect". Four, the order of the questions was kept identical as in the original questionnaires to rely on the quality of the instruments, which were "already-proved" measurements. By doing so, I have avoided to produce "assimilation" or "contrast" effects by increasing information though preceding questions in the survey, or by making respondents to exclude information from their cognitive representation of the question, respectively (the latter is likely to emerge since this survey is highly specific: entrepreneurship context-based). A way to deal with this issue would have been to make questions random. This alternative was *not* implemented in this survey. Fifth, confidentiality and anonymity were guaranteed to all the respondents to the purpose of getting acceptable quality in responses (Bentler, 1987). This was fulfilled by activating the hidden email's respondent option (from the author) in the Questback's dashboard.

The questionnaire, shown in the Appendix section of this study, was divided in four different sections. The first one, was compounded of four demographic questions; the second one was devoted to self-efficacy (12 questions; i.e., *Can I influence customers' decisions related to our product/service*?), the third section to personal goal orientation and environment goal orientation (12 questions; i.e., *I like my work, even if I make a lot of mistakes*), and, the final section to perceived performance (3 questions; i.e., *How would you describe your overall performance?*).

Self-efficacy was measured using a Likert-scale from value “0” to “10”, in a range that was described as “I cannot do at all” (0), “I am moderately certain I can do” (5), and “Highly certainly I can do” (10). Personal goal orientation and environment goal orientation were measured also using a Likert-scale from value “0” to “10”, in a range that was described as “Not at all true of me” (0), “Moderately true of me” (5), and “Very true of me” (10). Finally, perceived performance was also measured using a Likert-scale from value “1” to “5”, in a range that was described as “Results are insatisfactory” (1), “Results need improvement” (2), “Results generally meet expectations: opportunity to expand results” (3), “Results fully meet expectations” (4), and, “Results exceed expectations” (5), based on Schools (2012).

Following in Table 1 is a statistical description of the means and standard errors for each of the variables of this research.

Table 1: Descriptive statistics. Means and standard errors of the variables

Mean estimation — Number of obs = 106

	Mean	Std. Err.	[95% Conf.	Interval]
Se_1	7.528302	.1989223	7.133876	7.922728
Se_2	6.59434	.2297615	6.138765	7.049914
Se_3	8.132075	.1838372	7.76756	8.496591
Se_4	7.103774	.2218639	6.663858	7.543689
Se_5	7.481132	.1873018	7.109747	7.852517
Se_6	7.518868	.214158	7.094232	7.943504
Se_7	7.037736	.205462	6.630343	7.445129
Se_8	8.311321	.1765005	7.961353	8.661289
Se_9	8.169811	.1719147	7.828936	8.510686
Se_10	8.122642	.1959623	7.734084	8.511199
Se_11	7.896226	.2144507	7.47101	8.321442
Se_12	7.377358	.2288503	6.923591	7.831126
Per_GO_1	8.160377	.214956	7.734159	8.586595
Per_GO_2	6.141509	.2631753	5.619682	6.663337
Per_GO_3	6.924528	.2506768	6.427483	7.421574
Per_GO_4	8.09434	.1935753	7.710516	8.478164
Per_GO_5	7.150943	.2313259	6.692267	7.60962
Per_GO_6	5.773585	.3078147	5.163245	6.383925
Per_GO_7	4.877358	.2871	4.308092	5.446625
Per_EGO_1	7.132075	.2333688	6.669348	7.594803
Per_EGO_2	6.5	.2368747	6.030321	6.969679
Per_EGO_3	6.45283	.2468606	5.963351	6.942309
Per_EGO_4	7.198113	.2487777	6.704833	7.691393
Per_EGO_5	7.066038	.2436134	6.582997	7.549078
Per_1	3.415094	.0802824	3.255909	3.57428
Per_2	3.622642	.0852593	3.453588	3.791695
Per_3	3.037736	.0947162	2.849931	3.225541

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Data Analysis

a. Analysis of outliers

Regarding the presence of outliers, according to (Cohen, 2003), if outliers are few less than 1% or 2% of the sample, and do not represent extreme cases, they can be "left alone". When looking at our scatter plot, we can see a couple of responses quite away from the rest of the group. I suspect of them to represent outliers. I will use an outlier labeling calculation to find out if they are real outliers or not. See histograms with the distribution of relationships between all the dependent variables (self-efficacy and perceived performance) and the independent variables (TGO/PGO and EGO) in Appendix 4.

As mentioned, I have used the outlier labeling rule (Hoaglin, 1986) to identify if those points away from the group represent or not real outliers. Based on this rule, I have calculated the lower and upper values according to the value of "g=2.2" suggested by those authors. Details of excel used to calculate the lower and upper values, which are considered the maximum limits, and beyond them, all the points are considered outliers, are shown in Appendix 5.

Calculations are based on percentiles 25 and 75. I have used a "g" value of 2.2, which is multiplied for the difference between percentile 75 minus percentile 25 (their values. See Appendix 6, Percentiles for the consolidated variables). The result is added to the value of the percentile 75, and rested to the value of percentile 25, which represent the upper and lower limits, beyond that, all observations are considered outliers (Hoaglin, 1986).

Then, I have checked out how many of the points are real outliers (following this rule) in the histograms in the Appendix 4. Later, I have also compared to Cohen (2003) suggestion of doing nothing to outliers if they represent something less than 2% (106*2%=2.12, then 2 observations). This is the case for all the consolidated variables considered (Self-efficacy total, TGO total, PGO total, EGO total and Performance total). Cohen's suggestion is fulfilled in all the cases, except for EGO, whose graphic suggests a few more observations less than the lower limit. However, since it constitutes the only one case in all the variables analyzed, I will not delete those observations from the sample.

b. Statistical Assumptions: Normality, linearity, homoscedasticity, and multicollinearity

The following procedure that I have run on the sample's data has been to test out the hypothesis of normal distribution, linearity, homoscedasticity, and multicollinearity. Let's go through each of them separately.

i. Normal distribution.

To test out if the sample's data used on this research is normally distributed I have used two different approaches. First, I have tested for skewness and kurtosis. Skewness is defined as the measure of the symmetry of a distribution where a positive value on skewness means that a distribution's mean lies on the right side of the distribution. Conversely, a negative value on skewness means that the distribution's mean lies on the left side of the distribution. Additionally, kurtosis is a measure of peakedness of a distribution. Positive kurtosis or leptokurtosis means an extreme peak in the center; meanwhile, a negative kurtosis or platykurtosis means an extremely flat distribution (Meyers, 2006).

Different authors suggest different rules for dealing with skewness and kurtosis. For example, a more conservative rule is suggested by (Hair, 1998) with a skewness and kurtosis' values inside an interval of +/- 0.5. A less stringent cutoff is suggested by Morgan (2001) and (George, 2003), who suggested that skewness and kurtosis should be around +/-1.00. Appendix 7 shows values of skewness and kurtosis for each of the variables involved in this research. This *univariate analysis* of normality indicates that univariate normality assumption (assumption of normality for each of the variables in this research independently) is fulfilled under the most stringent cutoff suggested (+/-0.5) for all the variables at $\rho=0.05$ significance level, except for the variables *Per_1* and *Per_3* (questions 1 and 3 respectively measuring Perceived Personal Performance) whose values are inside the cutoff rule, but are not statistically significant at $\rho=0.05$ ($\rho=0.4195$; $\rho=0.4812$, respectively).

The following step is to test out again univariate normality using a different test: Shapiro-Milk Normality test. Results are shown in Appendix 8, and indicate that the univariate normality assumption (normality assumption for each of the variables independently) is fulfilled for all the variables at $\rho=0.05$ level of significance, except for –again- the variables *Per_1* and *Per_3* (questions 1 and 3 respectively measuring Perceived Personal Performance)

as the skewness and kurtosis normality tests also had shown previously (ρ=0.26855; ρ=0.99998, respectively).

Due to variables *Per_1* and *Per_3* do not fulfill univariate normality assumption; I have made a logarithmic transformation on those variables as suggested by Meyers (2006). After doing so, I have run the previous two tests for normality to see if they fulfill univariate assumptions. They did so at ρ=0.05 level of significance, as shown in Appendix 9.

The final step in this analysis of normality distribution is to test out if multivariate normality assumption is also fulfilled.

I have run Mardia skewness and kurtosis, Henze-Zirkler, and Doornik-Hansen tests for multivariate normality. Null hypothesis of multivariate normality is statistically disregarded at ρ=0.05 significance for all the tests in the case of models TGO and PGO. Results are shown in Appendices 10 y 11. In the point (iv), I will graph the normal probability plots to re-check out if this violation assumption is true, and how serious is (if true).

ii. Linearity.

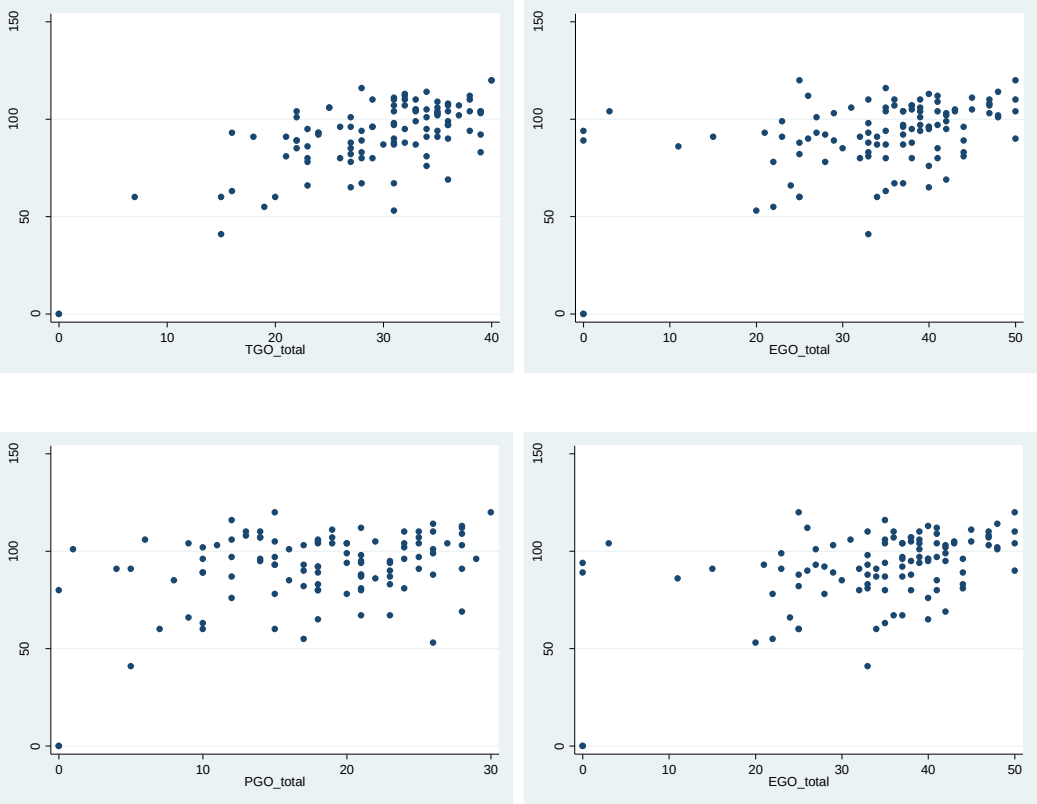
The second assumption to be tested out is linearity or assumption of linear relationship observed between two variables. Linearity implies that slope of the population regression function is *constant*; thus, non-linearity means, in words, that a change in the dependent variable of a unit of the independent variable *does depend on* the value of one or more of the independent variables (Stock, 2007).

To the purpose of doing linearity analysis, I will have to run a couple of linear regressions to test out independently the relationships underlying in the entire SEM model. To make this regression analysis possible, all the variables have been consolidated in four single variables: total self-efficacy scores, total TGO scores, total PGO scores and total Performance scores. Results for the regression analyses are shown in Appendices 12 y 13.

The first simple way to test out for linearity is by simply looking at the scatter plots relating each of the dependent variables in the regressions (Self-efficacy and Perceived Performance) with each of the independent variables (TGO/PGO, EGO, and Self-efficacy for the case of performance only). Scatter plots look like following (Graph 1) for the two different

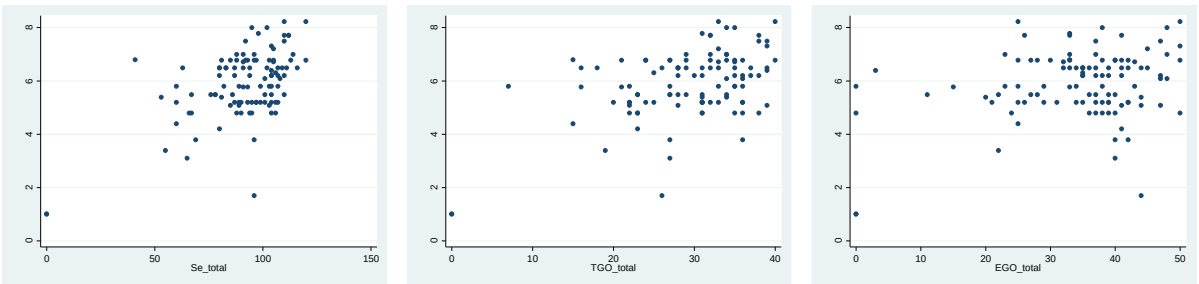
regressions run on self-efficacy: first in the upper raw, using TGO and EGO as regressors; and, the second regression, in the lower raw, using PGO and EGO as regressors. All these relationships look like pretty linear, with only a few points located too below or above the (imaginary) straight line standing out a perfect linear relationship.

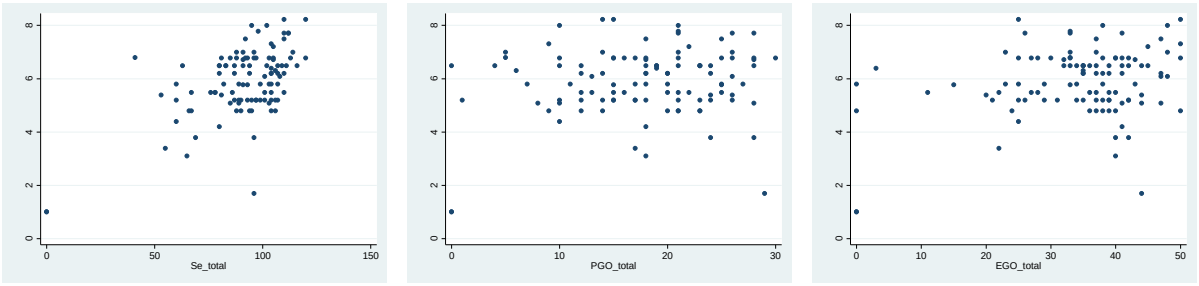
Graph 1: Linearity analysis on Self-efficacy as dependent variable



I also have plotted six scatter plots (Graph 2) for the two different regressions run on Perceived Performance; the first in the upper raw, using Self-efficacy, TGO and EGO as regressors; and, the second one, in the lower raw, using Self-efficacy, PGO and EGO as regressors. All these relationships also look like rather linear, with only a few points located too below or above the (imaginary) straight line standing out a perfect linear relationship.

Graph 2: Linearity analysis with Performance as dependent variable





Meyers (2006) points out that other approach for testing this hypothesis of linearity in the context of multiple regressions is to run a regression analysis and examine the residuals plot. Residuals indicate the portion of the dependent variable`s variance that is not explained by the regression analysis. Then, by doing so, I should pay attention to the R^2_s and to the "F-values". R^2 is the fraction of the sample variance of the dependent variable explained by the sum of the regressors or independent variables (Stock, 2007).

With this purpose in mind, I have looked at again to the different regressions using Self-efficacy and Perceived Performance as dependent variables, and TGO/PGO (separately) and Environment Goal Orientation as independent variables.

I have run linear regressions for all the relationships underlying in the SEM model. Regressions for self-efficacy showed to be statistically significant with acceptable R^2_s, for example, regression on TGO ($F=106.25$, $R^2=0.5054$, significant at $\rho=0.05$), on PGO ($F=18.21$, $R^2=0.1490$, significant at $\rho=0.05$), and for EGO ($F=31.85$, $R^2=0.2345$, significant at $\rho=0.05$). For the case of Perceived Performance, results are as following for the regressors self-efficacy ($F=44.06$, $R^2=0.2976$, significant at $\rho=0.05$), TGO ($F=33.56$, $R^2=0.2439$, significant at $\rho=0.05$), PGO ($F=1.96$, $R^2=0.0185$, *non-significant* at $\rho=0.05$), and EGO ($F=8.53$, $R^2=0.0758$, significant at $\rho=0.05$). Consequently, I have found evidence that the *relationships are sufficiently linear* to be tested in SEM for all the relationships independently, except for the case of Perceived Performance and PGO-orientation. This is a limitation that must be considered. However, when graphing the residual plots (point IV), I will see that they all look like pretty linear relationships indeed.

iii. Homoscedasticity.

The next assumption to test out is homoscedasticity, which is the assumption that "quantitative dependent variables have equal levels of variability across a range of (either

continuous or categorical) independent variables" (Hair, 1998). Violation of this assumption is called "heteroskedasticity".

I have run the Breusch-Pagan test for testing heteroscedasticity. The null hypothesis in this test is that of homoscedasticity. When Chi-square is significant, then we can reject the "homoscedasticity hypothesis", indicating evidence of heteroscedasticity.

Results show that for all the regressions is possible to reject the null hypothesis of homoskedasticity at $\rho=0.05$ level of significance. Regressions were as follow: two regressions for self-efficacy based on TGO and EGO, and PGO and EGO; and, two regressions for Perceived Performance based on TGO, EGO, and self-efficacy, and PGO, EGO, and self-efficacy. Stata results are shown in Appendices 14, 15, 16 and 17.

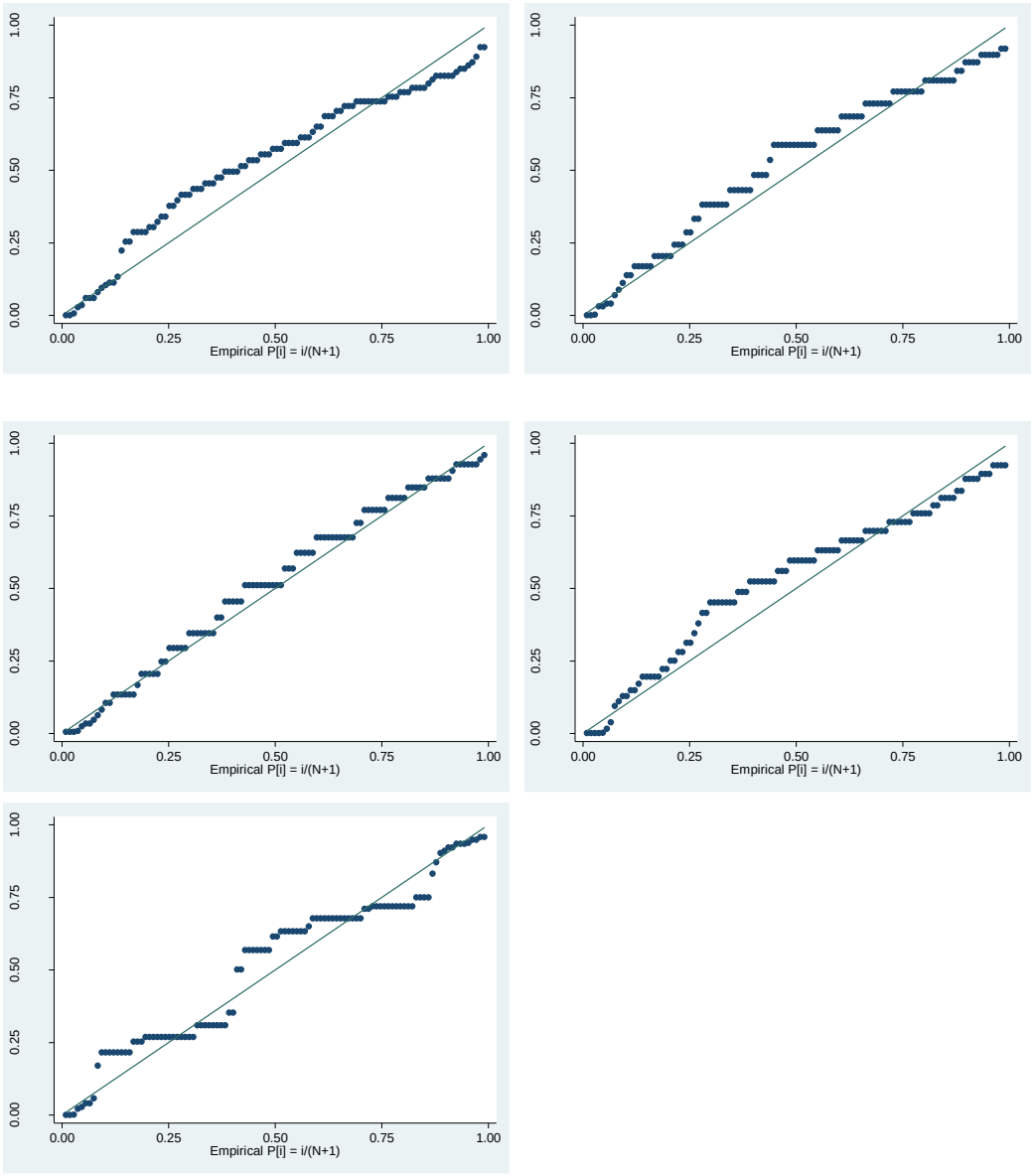
As we have seen, all the cases are showing the presence of heteroscedasticity. This constitutes a limitation in our statistical analysis, and it is indicating that the variance of the dependent variable is concentrated in only a limited range of values of the independent variable's values (Hair, 1995). In the next point, I will graph the residual plots to re-check out if this assumption violation is true and how serious is (if true).

iv. Normal probability plot and residual plot.

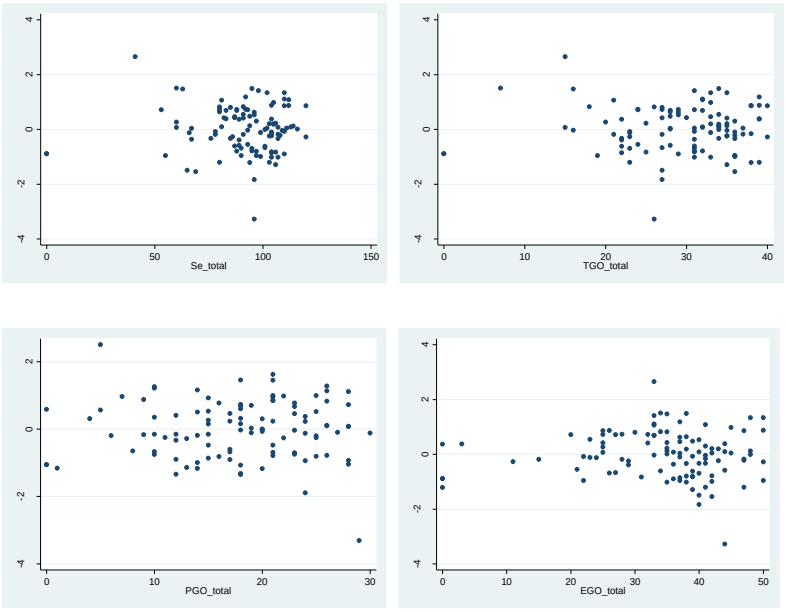
A second way to test multivariate normality, linearity and homoscedasticity is by graphing the normal probability plot (normality) and the residual plots (linearity and homoscedasticity) as suggested by (Hair, 1995); and then, compare them to the straight diagonal line (normality) or the null plot (linearity and homoscedasticity). This is an important procedure to re-check out the assumptions and violations suggested in the preceding sections. As it is shown in Graphs 3, 4 and 5, for the case of all the variables, and all the independent variables (self-efficacy, TGO/PGO, and EGO) in the case of explaining performance; and, TGO/PGO and EGO when explaining self-efficacy, *they all look pretty normally distributed, indicating an uniform distribution of the variables, and also they look like pretty as the null plot with some small deviations that constitute not clear indicators for nonlinearity or heteroscedasticity (Hair, 1995).* This suggests that, even though tests indicate the opposite, violations to the multivariate assumptions of normality and heteroscedasticity, those assumption violations *are not extreme cases* in this research. Anyway, we should consider this situation -to some discrete extent- a limitation for this research, even though it is worth mentioning that this is an

exploratory study, on a different field (entrepreneurship), and using a novel collection method. Therefore, these small deviations from the formal assumptions of normality and homoscedasticity may be regarded as acceptable when looking at situation graphed on the plots.

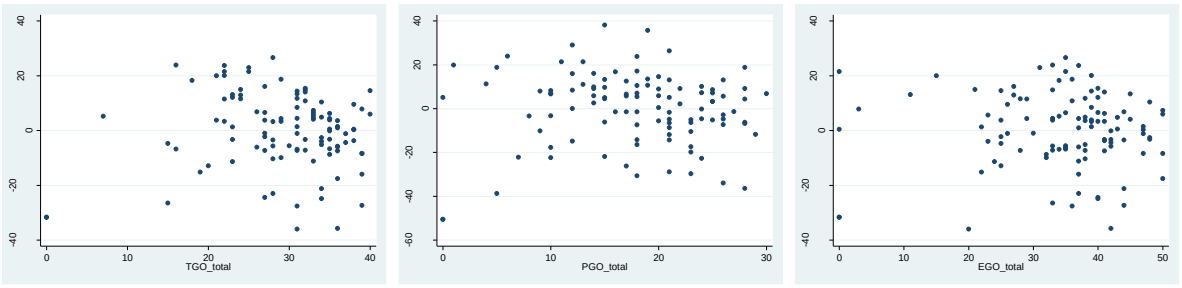
Graph 3: Normal probability plots



Graph 4: Residual Plots for Performance as dependent variable



Graph 5: Residual plots for Self-efficacy as dependent variable



v. Multicollinearity

Multicollinearity is produced when "any single predictor variable is highly correlated with a set of other predictor variables" (Hair, 1995). I have to analyze multicollinearity for two cases: first, when the explanatory variables for perceived performance are self-efficacy, TGO and EGO; and, second, when the explanatory variables are self-efficacy, PGO and EGO. I have run the two respective multiple regression on performance, and, later on, I have calculated the indicator "VIF" and tolerance (1/VIF), which are supposed to be less than "10" (or plus 0.10, respectively) (Hair, 1995). For all the cases, there is no evidence of multicollinearity among these explanatory variables. VIFs tables are shown in Appendix 18. I have also run two additional regression using self-efficacy as dependent variable (with TGO/PGO and EGO) to see if there is evidence of collinearity, but results (Appendix 19) also showed that it is not the case

vi. Summary of SEM Assumptions

In this part, I pretend to do a sum up of the formal assumptions needed for running a SEM model. I have also included some additional comments at this regard. This analysis mostly follows criteria suggested by Bentler (1987). Following criterions are evaluated:

First, independence of observations was fulfilled. There was no way that one respondent could influence in any way responses provided by another respondent in this sample.

Second, univariate and multivariate normality are sufficiently fulfilled as explained in section (iv).

Third, this sample is not a random sampling which means that each unit on the sample had no identical probability to be chosen into the sample. This may affect how applicable results can be, and it is suggesting possible bias.

Four, functional form which means that SEM assumes that all the relationships among the variables are linear. This is fulfilled in this research.

Fifth, sample size. Bentler (1987) suggested the following rule for determining whether sample size is good enough: the ratio of sample size to number of free parameters may be able to go as low as 5:1. This author also recommended a ratio of 10:1 for the case of samples arbitrarily distributed. In this study, that ratio is 53:25 which is lower than the two afford mention rules. This certainly constitutes a limitation in the quality of the analysis.

Sample size obtained in this research is not ideal for SEM analysis and might eventually present some disadvantages for our further analysis and for the reliability of the parameter estimates, fit, and statistical power (Shah, 2006). Particularly, some problems might be observed on parameter estimates with low reliability and greater bias in X^2 and RMSEA fit statistics once evaluating model fit. However, the necessary sample size is also affected for the degrees of freedom of the model (MacCallum, 1996; Shah, 2006).

Six, an identified model. This model is "overidentified" since the number of free parameters to be estimated is fewer than the value given by Schumacker (2004)'s formula: ***p(p+1)/2***, where "p" represents the number of observed variables. In this project, the number of free parameter is 50, and our formula gives us a value of 50 (24(24+1)/2=300). So 50<300 (true), then our model is overidentified.

Seventh, a prior structural hypothesis. These models have also been identified *ex ante* as shown in the previous section. Figures 1 and 2 showed the pre-established relationships among the variables that have been put under research.

Seven, and final, assumptions of non-multicollinearity is also fulfilled.

c. Reliability Analysis

As mentioned, this questionnaire was made up of 31 questions. The first 4 questions were demographics as nationality, age rage, level of education, and gender. The following 27 questions were intended to measure the theoretical constructs under investigation in this research.

The first step is to test out reliability on the five different latent constructs that are involved in this research. Reliability refers to the "consistency of a measure", which means that a measure is able to provide consistent results under consistent conditions; to some extent, it refers to the precision of the instrument (Sudman, 1996). Reliability of a constructs depends on how much of the variation is due to the random error; thus, a perfect reliable constructs is the one with a random error equal to "0". Random errors are constituted by deviations from the true score that "are statistically unrelated to deviations in any other measure being analysed concurrently" (Andrews, 1984). Consequently, reliability is a necessary condition for validity, but not sufficient (Churchill, 1979). This author also points out that a highly reliable construct should exhibit a set of items (items that are thought to measure the construct), which are highly intercorrelated. For doing so, we can use the Cronbach's alpha, which is a measure of how well or poorly the items capture the latent construct (Churchill, 1979).

I will show Cronbach's alphas for each of the relevant constructs: self-efficacy, perceived personal goal orientation (separately for TGO and PGO), perceived environmental goal orientation and perceived personal performance, and this information will constitute evidence for "convergent validity" of the respective constructs.

i. Reliability on self-efficacy

Self-efficacy constructs was measured using a 12-questions section based on the questionnaires used by A. Bandura (2006). Reliability of this constructs (Cronbach's alpha) is 0.948 which shows a very high reliability of the construct. This is not unexpected since it is based on a largely-used scale built by the aforementioned author. Detail of the self-efficacy section (Appendix 24) and Stata report for the Cronbach's alpha (Appendix 20) are also shown.

ii. Reliability on Task Goal Orientation (TGO) and Performance Goal Orientation(PGO)

The next construct analyzed was Perceived Personal Goal Orientation based on 7 questions listed in the Appendix section. This constructs is based on the questionnaire by (Anderman, 1997) and is divided in two different dimensions that were analyzed separately: Task Performance Orientation (TGO) and Performance Goal Orientation (PGO) in Appendix 24. Reliability information is reported for the both constructs TGO and PGO respectively, and the both show high reliability coefficients (0.81; and, 0.75). Stata report is shown in Appendix 21.

iii. Reliability on Perceived Environment Goal Orientation (EGO)

The next construct analyzed was Perceived Environment Goal Orientation. The instrument contains 5 questions based on (Anderman, 1997). Description of the questions of the construct (Appendix 24) and the reliability of the constructs (0.92) is also shown in (Appendix 22). Reliability coefficient is also high for the EGO construct.

iv. Reliability on Perceived Personal Performance

The final constructs was Perceived Personal Performance which is a self-reported performance metric created especially for this research by the author. At this regard, reliability of the constructs is lower than the previous ones (0.62). Situation was expected since was a new design, and, therefore, it constitutes an acceptable reliability for a new measure in an exploratory field (entrepreneurship). However, this limitation in this dependent construct will be discussed in more detail once discussing results of this research. Questions of this section are shown in Appendix 24 and Cronbach's alpha is shown in Appendix 23.

d. Factor Analysis.

The next step is to test out construct validity. Construct validity is "the extent to which an observed measure reflects the underlying theoretical construct that the investigator has intended to measure" (Cronbach, 1955). I will run Factor Analysis for finding evidence of construct validity, specifically, "divergent and convergent validity" for each of the latent constructs, since the primary goal in factor analysis "is to explain the covariance or

correlations between many observed variables by means of relatively few underlying latent variables. In this sense is a data reduction technique" (Bollen, 1989).

In this section, I will present the unrotated factor solutions (Appendix 25), which "extract factors in the order of their importance. The first factor tends to be a general factor with almost every variable loading significantly and it accounts for the largest amount of variance" (Hair, 1995).

I have run two different factor analyses. The first factor analysis is considering 24 questions and is intended to measure self-efficacy, environmental goal orientation, TGO-orientation and perceived performance. In this case, factor analysis provided evidence for only 3 factors underlying the entire questionnaire. In the analysis, I will use the eigen's value rule. Eigen's value is the amount of total variance explained by a factor; where, total eigen value is equal to the sum of the number of items.

Specifically, eigen's values greater than 1 are only three as shown in the Appendix 25. However, eigen's value for factor 4 is 0.82. Maybe this is suggesting that TGO construct is hardly related to the Environmental Goal Orientation construct since the latter, as worth mentioning, actually represents ***how TGO-oriented is the environment perceived by respondents***. Consequently, the two both constructs might be closely intertwined and measuring something similar. However, if using the "principal components analysis" as suggested by Blunch (2008), I can justify that the inclusion of the four factor is increasing the amount of cumulative variance from 86% to 92% (approx.), which is a reasonable amount of variance explained. However, there is still some reasons to think that there are two factors measuring something similar. Final results should consider this situation when analyzing significance of results.

However, regarding the theoretical evidence found in the literature review and results by other authors, and, regarding the fact that eigen's value is an arbitrary cutoff rule, and due to in this case factor 4 presents a value 0.82 (closely to 1), I will continue working with four separate constructs: TGO-personal orientation, Environmental Goal Orientation, Perceived Performance, and Self-efficacy. However, this situation will be discussed in detail when I present results of the SEM estimation.

The second factor analysis considered 23 questions measuring self-efficacy, perceived performance, environmental performance and PGO-orientation. In this case, I also found that factor 4 is lower than 1 (=0.95). This number is certainly closer to 1 than in the previous case (TGO-orientation) and we should look at it carefully since –again- eigen`s value is an arbitrary rule. However, if using the "principal components analysis" as suggested by Blunch (2008), I can justify that the inclusion of the four factor is also increasing the amount of cumulative variance from 86% to 92% (approx.), which is a reasonable amount of variance explained. However, there is still some reason to think that there are two factors measuring something similar. As in the TGO-analyses, I will continue working with the four constructs as planned. In this particular case, however, evidence is quite stronger to support this decision. I will discuss plausible hypothesis explaining this situation later on. For now, it is enough to say that I will base my decision on the extensive literature exhibited in the first section of this master showing that personal goal orientation (TGO and PGO) should be treated as a separate construct from environmental goal orientation (Anderman, 1997).

A third round of Factor Analyses was implemented over each of the five constructs: self-efficacy, perceived performance, environmental orientation and TGO and PGO-orientations. These analyses will provide us with additional information about convergent reliability of the under-research constructs.

For the case of self-efficacy, there is strong support to say that there is only one constructs (factor) underlying the 12-questions section intended to measure Self-efficacy. Factor 1 has an eigen's value of 7.64 while the factor 2 has an eigen's value of 0.71, substantially lower than the expected value of 1 (the rule of thumbs). Principal component analysis also validates this as more than 80% of variance is in fact explained by one single factor. Consequently, this section is measuring only one single thing.

For the case of environmental goal orientation, there is strong support to say that there is only one constructs (factor) underlying the 5-questions section intended to measure Environmental Goal Orientation. Factor 1 has an eigen's value of 3.52 while the factor 2 has an eigen's value of 0.11, substantially lower than the expected value of 1 (the rule of thumbs). Principal component analysis also validates this as more than 80% of variance is in fact explained by one single factor. Consequently, this section is measuring only one single thing.

For the case of Perceived Personal Performance, there is strong support to say that there is only one constructs (factor) underlying the 3-questions section intended to measure Perceived Personal Performance. Factor 1 has an eigen's value of 1.46 while the factor 2 has an eigen's value of -0.13, substantially lower than the expected value of 1 (the rule of thumbs). Principal component analysis also validates this as more than 80% of variance is in fact explained by one single factor. Consequently, this section is measuring only one single thing.

For the case of TGO-Goal Orientation, there is strong support to say that there is only one constructs (factor) underlying the 4-questions section intended to measure the TGO-Goal Orientation. Factor 1 has an eigen's value of 2.07 while the factor 2 has an eigen's value of 0.03, substantially lower than the expected value of 1 (the rule of thumbs). Principal component analysis also validates this as more than 80% of variance is in fact explained by one single factor. Consequently, this section is measuring only one single thing.

For the last case of PGO-Goal Orientation, there is strong support to say that there is only one constructs (factor) underlying the 3-questions section intended to measure the PGO-Goal Orientation. Factor 1 has an eigen's value of 1.4 while the factor 2 has an eigen's value of -0.11, substantially lower than the expected value of 1 (the rule of thumbs). Principal component analysis also validates this as more than 80% of variance is in fact explained by one single factor. Consequently, this section is measuring only one single thing.

e. SEM Analysis

I will test out the measurement model before testing the structural one. If the measurement model is not validated then model should be changed before going further. The measurement model involves the number of factors, the way of indicators relate to factors, and relationships among indicators' errors. The measurement model provides an assessment of *convergent and discriminant validity* (Schumacker, 2004). In the other hand, the structural model involves basically how latent factors relate one to another. It provides assessment of *predictive validity* (Schumacker, 2004).

Data analysis has been done using SEM (Structural Equation Modeling) which is "a technique to specify, estimate, and evaluate models of linear relationships among a set of observed variables in terms of a generally smaller number of unobserved variables" (Shah, 2006). The main purpose to use SEM is to determine whether the model established a priori is valid or not (Shah, 2006). This validation means to determine if the theoretical model is supported by

the sample's data (Schumacker, 2004).This validation implies that SEM looks for development and testing of theory through determining structural relationships (Anderson, 1988), and one of its main advantages is the possibility to estimate the measurement error. The measurement error constitutes the "consistent tendency for a measure to be higher or lower than it should be", and it may be random or correlated (Andrews, 1984) .

Specifically, I will implement a Confirmatory Factor Analysis (CFA) to test out the both models. In general terms, CFA is a better alternative than ANOVA because the latter assumes that the indicators' scores reflect the same level of the latent construct. Differently, CFA estimates relationships among variables adjusting for the measurement errors (T. A. Brown, 2006). In the case of a model of 4 latent variables (as this is), at least two indicators per construct (latent variable) is suggested to the purpose of guaranteed and "over-identified" solution (T. A. Brown, 2006). Additionally, an advantage of using more than one indicator is that if I did so (just one indicator), I would be assuming that the latent variable has no measurement error associated to (Schumacker, 2004).

In this master thesis, as shown previously, two models will be tested out. Model-1 works with TGO-Goal Orientation; and, Model-2 does it with PGO-Goal Orientation. Patterns of relationships among variables are identical in the both cases.

SEM does not fit for exploratory studies (Shah, 2006). In the case of this study, all the relations among LVs and OVs have been documented and extensively discussed previously. In other words, the models under research have been –as required by SEM- defined a priori. Estimation of the parameters `estimates has been done using Maximum Likelihood Method.

The first thing that it is worth being mention is how to interpret the parameters of the model. SEM model will provide three types of parameters' estimates: first, "Factor Loadings" which are regression slopes for predicting indicators from the latent factors (T. A. Brown, 2006). Second, "Unique Variance" which is the variance in the indicator that is not accounted for the latent factor. It represents the measurement error and is an indicator's unreliability (T. A. Brown, 2006). And, third, Factor Variances which are sample variability or dispersion of the factor in a standardized solution (T. A. Brown, 2006). For the case of this research, the measurement error has been assumed *unsystematic*, which means that there is no correlation between the measurement errors of the indicators in any of the constructs under analysis (T. A. Brown, 2006). Factor loadings are useful for a second round of interpretation because

(Factor loading)^2 is equal to *"Commonality"*. Commonality is the amount of variance in the indicator explained by the common factor (T. A. Brown, 2006). Consequently, (1-Commonality) equals the unique variance.

In this research, I will test out two different models: one testing TGO-orientation and, the second one, testing PGO-orientation. Regarding the fact that I have used identical scales (0 to 10) for measuring self-efficacy, TGO/PGO goal orientations and environment goal orientation (EGO), and those variables are the explanatory variables for the case of performance, (and self-efficacy is explained by TGO/PGO and EGO), it *will not be necessary to standardize* the coefficient's estimates since, in simple words, the explanatory variables are measured in the same units and thus it is possible to compare their coefficients and see which of them have the greater effect on the dependent variables (Bollen, 1989). Consequently, all the SEM's results are non-standardized estimates.

f. SEM`s results

The first step then is to test out the measurement model for the case of model-TGO. As shown in Appendix 26, all the factor loadings in each of the four factors are *statistically significant* at ρ=0.05. Covariance between TGO and Environmental Goal Orientation has been constrained to "0" (inexistent). There are also four additional constraints (to "1") in the factor loadings of *Se_1, Per_GO_1, Per_EGO_1*, and *Per_1*.

Secondly for model-TGO, I have tested out the structural model and see which of the structural relationships are statistically significant. Model Chi-Square = 598.69 statistically significant. Structure Coefficient relating Self-efficacy on Perceived Performance is 0.05 significant at ρ=0.05. Likewise significant at ρ=0.05, is the relationship between TGO-oriented personal goal orientation on Self-efficacy with a structure coefficient of 0.57. The rest of the relationships: Environmental Goal Orientation on Self-efficacy (0.05), TGO on Perceived Performance (0.00) and Environment Goal Orientation on Performance (0.00) are *not statistically significant* at ρ=0.05.

The next analysis is for the case of model-PGO.

The first step is to test out the measurement model for the case of model-PGO. As shown in Appendix 27, Appendix section, all the factor loadings in each of the four factors are *statistically significant* at ρ=0.05. Covariance between TGO and Environmental Goal

Orientation has been constrained to "0" (inexistent). There are also four additional constraints (to "1") in the factor loadings of *Se_1, Per_GO_5, Per_EGO_1*, and *Per_Perf_1*.

The second step is to test out the structural model and see which of the relationships are statistically significant. Model Chi-Square (492.48) is statistically significant. Structure coefficient relating Self-efficacy on Perceived Performance is 0.05 significant at ρ=0.05. Likewise significant at ρ=0.05 are the relationships between PGO-goal orientation on Self-efficacy with a coefficient of 0.26; and Environmental goal orientation (EGO) on Self-efficacy with a coefficient of 0.27. The rest of the relationships: PGO on performance (-0.00: negative as expected but not significant) and EGO on Performance (0.00) are *not statistically significant* at ρ=0.05.

g. Analysis of model fit

The two SEM models will be evaluated using several different fit indexes following Hooper (2008). Basically, the main idea is to provide different alternatives and approaches about how well (or bad) these two models fit the data. In general terms, these indexes can be grouped into three different categories: (a) Absolute fit indexes; (b) Incremental fit indexes; and, (c) Parsimony fit indexes.

(a) Absolute fit indexes "indicate how well the proposed interrelationships between the variables match the interrelationships between the actual or observed interrelationships. This means how well the correlation/covariance of the hypothesized model fits the correlation/covariance of the actual or observed data" (Meyers, 2006).

(b) Incremental fit indexes "are measures of fit relative to the independence model which assumes that there are no relationships in the data (thus a poor fit) and the saturated model, which assumes a perfect fit" (Meyers, 2006).

(c) Parsimony fit indexes "can be used to compare models with differing number of parameters to determine the impact of adding additional parameters to the model" (Meyers, 2006).

The first index to be shown is Chi Square (Absolute fit). Chi-Square "assesses the magnitude of discrepancy between the sample and fitted covariance matrices" (Hu, 1999). In other words, Chi Square assesses if the observed covariance matrix is similar to the predicted covariance matrix (predicted by the model under research). Limitations with this overall index are two: (i) it assumes multivariate normality; and, (ii) it is sensitive to sample size. Thus, when Chi Square is significant the model is regarded as non-acceptable. Chi-square is less informative for measuring single models but can be very useful when comparing different models. In this case, the model with the lower Chi Square is considerable the one with the better fit (Meyers, 2006).

RMSEA (Root Mean Square Error of Approximation, Absolute fit) is an indication of how well the model, with unknown but optimally chosen parameters estimates would fit the population covariance matrix (Byrne, 1998). In other words, RMSEA represents the differences between elements of the observed and predicted (by the model) covariance matrix. Zero is a perfect fit and the maximum is unlimited. Hooper (2008) suggest as a rule that RMSEA values <0.06 can be interpreted as goodness of fit. Values lower than 0 .08 are also accepted (Browne, 1993)—and some authors suggest ideal values less than 0.05 (Steiger, 1990). The upper confidence interval should not exceed 0.08 (Hu, 1999).

The CFI (Comparative Fit Index, Incremental fit) compares the model under research with some alternative, as i.e. the null or independence model (an assumed model where all the variables are uncorrelated). The CFI also represents the difference between the observed and predicted (by the model) covariance matrices. CFI would not be much sensitive to sample size (Fan, 1999). Hooper (2008) suggest a CFI>=0.95 for models with good fit.

The Tucker Lewis Index (TLI) or Non-Normed fit index (NNFI) is an Incremental type of index. TFL is relatively independent of sample size (Marsh, 1988) and values greater than 0.90 or 0.95 are considered acceptable (Hu, 1999).

Fit indexes are in Appendices 28 and 29. For the case of the model-TGO, Chi-Square (598.69) is significant at ρ=0.05 implying overall bad fit. The same thing is happening to the model-PGO as Chi Square (492.48) is significant at ρ=0.05 implying overall bad fit too. Model-PGO has a lower Chi-Square meaning that fits better data in comparison to model-TGO, but still without an acceptable fit.

For the case of the model using TGO-goal orientation, RMSEA is 0.116 implying a bad goodness of fit of the model. RMSEA for the PGO-model is 0.106 also implying a bad fit.

For the case of the model using TGO-goal orientation, SRMR (Standardized Root Mean Square Residual) is 0.167 which is not in the interval of 0-0.08 suggested by Hooper (2008) and consequently, implying a bad fit. For the case of the PGO-model SRMR is 0.095, which is also outside the interval previously suggested and implying bad overall fit.

For the case of the model using TGO-goal orientation, CFI is 0.837 indicating also a bad fit. For the PGO-model, CFI is 0.864 also implying bad fit.

For the case of the model using TGO-goal orientation, TLI is 0.818, a lower value than the ones regarded as acceptable. This implies –again- evidence for a bad incremental fit of the model. For the case of the PGO-model TLI is 0.847 also implying an incremental bad fit of the model.

Finally, I will also report the $R^2_{s,}$ the amount of explained variance in the dependent variable, for the two dependent variables defined in these models: self-efficacy and perceived performance. For the case of model-TGO, R^2 of self-efficacy was 0.715; and, R^2 of perceived performance was 0.469. For the case of model-PGO, R^2 of self-efficacy was 0.295; and, R^2 of perceived performance was 0.515.

Consequently, none of the fit indexes is indicating a good fit of neither model-TGO nor model-PGO. R^2_s are not particularly high either, except for the case of self-efficacy in model-TGO. However, model-PGO is able to explain more variance in performance than model-TGO, which could explain why presents an overall better fit. In final words, *I have clear evidence to conclude that these two models exhibit a bad fit for the sample's data. Reasons and implications of this will be discussed in the next and final section of this master thesis*. First, I will proceed with some modifications.

h. SEM's Modification Indices

As the both models exhibited a poor data fit, I will provide in this section the Modification Indices to the purpose of exploring changes in the specification of the models, which might improve the data fit.

I showed in Appendix 30, MI_s indices for model-TGO. MI_s for the structural model shows that there are no significant reductions of Chi-Square derived from adding new structural relationships suggested in the left column. However, we can indeed expect some significant reductions on Chi-Square from adding some covariances among some indicators: Se_1 with Se_2 (28.984, amount of reduction in Chi-Square); Se_1 with Se_3 (12.601); Se_1 with Se_11 (15.081); Per_EGO_4 with Per_EGO_5 (20.585); and, also Per_TGO with Per_EGO (27.290).

Theoretically, those modifications must be explained before going further. The correlation suggested by the system between TGO and EGO is rather easily explainable. As mentioned previously, they both are closely related since EGO is concretely measuring *how TGO-oriented is perceived the environment.* Thus, this correlation might be suggesting that either TGO-personal orientation as TGO-environment orientation would affect to each other, reinforcing their respective effects on individual perceptions.

Correlations among self-efficacy's indicators suggest that self-efficacy level related to perceptions on managing employees and customers might be highly correlated. This makes sense if we look at employees as the primary and internal customers of any company.

Finally, for the case of EGO's suggested correlations, they are related to the opportunity to express point of view to investors, partners and Board, and to be encourage to find different ways to solve problems. They both refer to communication issues, to the capacity to be listened and encouraged to talk about different aspects of the business life.

We can also look at the equation-level goodness of fit output provided by Stata. Here, we can look at the R^2 for each single indicator in the SEM model. When doing so, I can observe that the following indicators are exhibiting low R^2 in comparison to the other indicators measuring the same construct. Concretely, Se_2 exhibits an R^2=0.289; and Per_GO_2 (R^2=0.347), suggesting that they might be droped out from the model, regarding that the level of variance explained by the respective factor is comparatively low.

Now, I showed in Appendix 31, MI_s indices for model-PGO. MI_s for the structural model shows that there is no significant reductions of Chi-Square derived from adding the relationships suggested in the left column. However, we can indeed expect some significant reductions on Chi-Square from adding some covariances among some indicators: Se_1 with

Se_2 (29.110, amount of reduction in Chi-Square); Se_1 with Se_3 (13.290); Se_1 with Se_11 (15.277); and Per_EGO_4 with Per_EGO_5 (18.790).

Theoretically, the explanations for these correlations are identical to the ones made for the model-TGO. Curiously, in this case, there is no suggestion for making correlate PGO and EGO. Additionally, when looking at the results, in this case, either PGO as EGO show significant effects on self-efficacy, providing some evidence that when PGO is measured, how TGO-oriented is the environment perceived *turn out highly relevant*. In fact, the effects on self-efficacy of PGO and EGO are equivalent as shown in the model-PGO.

We can also look at the equation-level goodness of fit output provided by Stata. Here, we can look at the R^2 for each single indicator in the SEM model. When doing so, I can observe that the following indicators are exhibiting low R^2 in comparison to the other indicators measuring the same construct. Concretely, Se_2 exhibits an R^2=0.294, suggesting that could be droped out from the model.

i. Modificated models

I have implemented the following modification to model-TGO: I have dropped out Se_2 and Per_GO_2, and have included some covariances between: Se_1 with Se_3; Se_1 with Se_11; Per_EGO_4 with Per_EGO_5; and, TGO with Per_EGO. After doing so, the same significant relationships are also significant after modifications. Chi-Square for the new model is 405.008 significant at ρ=0.05, better than the previous one. Indices showing goodness of fit are shown in Appendix 32, and point out that its goodness of fit is still non acceptable. However, in this case, SRMR (0.06) is between the interval accepted as goodness of fit (0-0.08).

I have also made some modifications to the model-PGO: Se_2 was dropped out; and, I added some covariances among indicators: Se_1 with Se_3; Se_1 with Se_11; and, Per_EGO_4 with Per_EGO_5. After doing so, the same significant relationships are also significant after modifications. Chi-Square for the new model-PGO is 375.28, significant at ρ=0.05, implying the best fit of all the models. Indices showing goodness of fit are shown in Appendix 33, and point out that its goodness of fit is still non acceptable. However, I must stand out that CFI and TLI are close values to ones regarded as acceptable, which might imply that this model with some additional modification may improve its goodness of fit satisfactory.

I have then obtained the Modification Indices of this modificated model-PGO, which suggest that I should include some covariances among indicators of different constructs (i.e., Se_10 with Per_EGO_4), however, those new relationships are rather unclear to be explained theoretically. A more appropiate way would be to respecify the entire model into different constructs, and include a more robust theoretical background to explain performance, *which is the weakest part of the model*. The model-PGO, at this regard, offers a better start point in comparison to model-TGO.

Part 8: Discussion

Neither Model-TGO nor Model-PGO have shown an acceptable fit for explaining relationships existing among the variables in the sample's data. However, it still is possible to conclude valuable insight from this research.

i. The both models were suggesting that personal goal orientation (either TGO or PGO) was impacting *positively and directly* on self-efficacy. It is worth to stand out that ***PGO did impact directly and positively on self-efficacy, and this impact is quantitatively equivalent to the EGO's impact on self-efficacy***. This is contradictory with what some authors have been suggesting that PGO might diminish self-efficacy. According to this finding, there would be no reason for treating PGO-orientation as a maladaptive pattern of behaviour in entrepreneurial contexts, regarding its positive effect on self-efficacy.

ii. An interesting second finding is that environment orientation *(EGO) effect is statistically significant only when is measured alongside with PGO, but it is not with TGO*. This might be suggesting that EGO works as a "moderator" or as "partner" for PGO-orientations, in terms of providing a necessary "external quote" of task-orientation for individuals (let's remind that EGO was measured here in terms of *how TGO was the environment perceived*). At the contrary, when measuring TGO-orientation, EGO-environment has no effect on self-efficacy, which tells us that all the effect on self-efficacy is provided by the *personal* goal orientation and the environment turns out *irrelevant.* This independence of TGO from the EGO-environment confirms what some authors have suggested as TGO

as a desirable personal characteristic, and according to my findings, I may sustain that *TGO affects self-efficacy independently of the kind of environment.*

iii. Third, there is no significant direct effect of personal goal orientation (TGO/PGO) or EGO-environment on perceived performance. The entire effect is mediated by self-efficacy. This is contradictory with what some authors have found, regarding personal orientation and environment as an important factor related to performance. I have found no proofs for sustaining this on the entrepreneurial environment. This is difficult to explain theoretically. Are learning strategies irrelevant in entrepreneurial contexts? A primary and exploratory explanation for this is that may be necessary to adjust the way performance has been measured in this research (self-reported performance), and obtain *more objective metrics*. A second hypothesis is that in further research it is necessary an improved metric for personal goal orientation which can treat simultaneously TGO and PGO. I may suspect, according to the results of this research, that as *TGO as PGO are desirable attributes*, since the both of goal orientations impact positively self-efficacy and, therefore, a proper metric of personal goal orientation might consider them accordingly.

iv. Fourth, ***self-efficacy did impact positively and directly on performance***. This confirms what many authors have found regarding self-efficacy, however, in this study, the direct and positive effect of self-efficacy on performance was relatively low in magnitude. Structural coefficients indicate that increases on self-efficacy levels are associated to poor increases in perceived performance. This is disconcerting and frustrating at the same time. One possibility is-again- that self-reported performance is a bad way to measure performance, and in further research, performance might be measured with more objective metrics.

v. Fifth, there is some evidence in this research–as mentioned previously- that TGO and PGO should be worked together. One alternative is maybe through an index that can consolidate its results and provide a single metric of personal goal orientation, which the higher value is associated to TGO orientation, and the lower to PGO. Another alternative, *which I would regard as more appropriate*, it is to work personal orientation where *they both (TGO/PGO) are treated identically*, and

subjects showing better results were those exhibiting higher levels in the both constructs at the same time. This would suggest that the two personal orientation are necessary and "desirable" in entrepreneurial settings, and would confirm what some authors have suggested, regarding that TGO is good when situation demands learning, and PGO when situation demands motivation to persist in effort. At this regard, I have run Factor analysis on the seven questions measuring personal goal orientation (TGO + PGO), and results provided evidence that there is only one single factor underlying those questions and, thus, that TGO and PGO should be treated in further research as a single positive personal goal orientation that we might regard as a double-purpose personal goal orientation.

vi. Poor fit indices tell us that ***our model requires some degree of re-specification, mainly on the performance explanatory part***. In further research, it might be advisable to include additional theoretical constructs for trying to connect in a more significant way personal behaviours with entrepreneurial performance. In this case, self-efficacy alone was an incomplete explanatory variable, and personal goal orientation showed no direct effect on performance. It is also recommendable to screen on the way performance is measured. In this research, I have used a self-reported metric of performance, which might not be an ideal metric.

vii. Generalizability of this research is limited. Sample has been obtained from highly connected group of people through using Internet and Social Media. This sample seems to fit better what is called start-up environment, but eventually might present some limitations on more traditional entrepreneurial environments.

viii. Finally, I have built a valuable model for working with self-efficacy. Personal goal orientation and environment goal orientation did impact significantly on self-efficacy, and -if following the extensive evidence in the literature- self-efficacy is indeed a desirable element in performance issues, even though its effect in this particular research has been "rather low".

Part 9: Appendix section

Appendix 1. Gender proportions, 1=females; 0=males

```
. proportion Gender

Proportion estimation               Number of obs    =       106

--------------------------------------------------------------
             |   Proportion   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
Gender       |
           0 |     .7169811   .0439609      .6298147    .8041475
           1 |     .2830189   .0439609      .1958525    .3701853
--------------------------------------------------------------
```

Appendix 2. Age distribution of the sample, where

(1=15-20; 2=21-25; 3=26-30; 4=31-35; 5=36-40; 6=41-45;7=46-50; 8=51-55; 9=56-60; 10>=61)

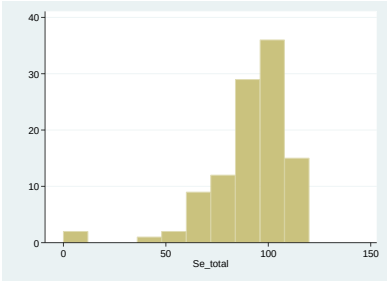
```
Proportion estimation               Number of obs    =       106

--------------------------------------------------------------
             |   Proportion   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
Age_range    |
           1 |     .0283019   .0161837     -.0037875    .0603912
           2 |     .0754717   .0257785      .0243577    .1265857
           3 |     .0943396   .0285256      .0377786    .1509007
           4 |     .1886792   .0381824      .1129705     .264388
           5 |     .1226415    .032012      .0591677    .1861154
           6 |     .1509434   .0349366      .0816706    .2202162
           7 |     .0471698   .0206893      .0061468    .0881928
           8 |     .1320755   .0330413      .0665606    .1975903
           9 |     .0943396   .0285256      .0377786    .1509007
          10 |     .0660377   .0242363      .0179817    .1140938
--------------------------------------------------------------
```

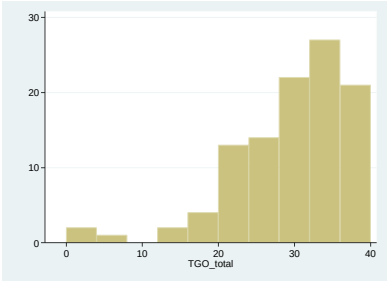
Appendix 3. Distribution of level of education

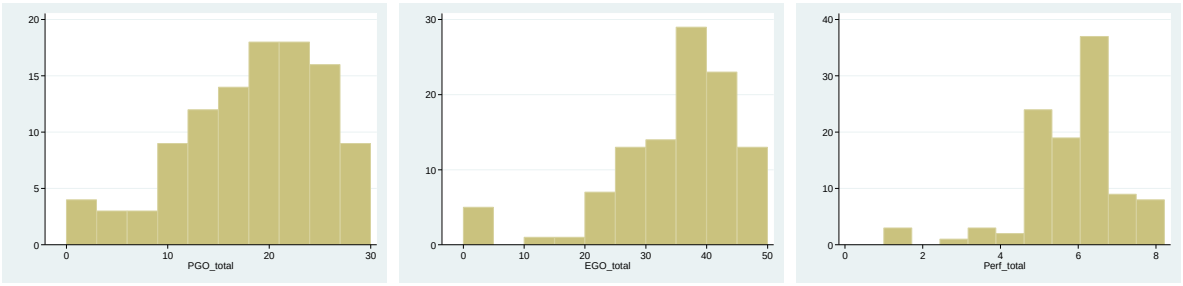
Where 1= Secondary school; 2= Undergraduate; 3= Master, MBA graduate; 4= PhD Graduate; 5= Other)

```
. proportion Edu_level

Proportion estimation               Number of obs    =       106

--------------------------------------------------------------
             |   Proportion   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
Edu_level    |
           1 |     .0471698   .0206893      .0061468    .0881928
           2 |     .4811321   .0487602      .3844495    .5778146
           3 |     .0754717   .0257785      .0243577    .1265857
           4 |     .0849057   .0272024      .0309684    .1388429
           5 |     .3113208   .0451875      .2217224    .4009191
--------------------------------------------------------------
```

Appendix 4. Histograms with frecuencies for Self-efficacy, TGO, PGO, EGO, and Performance







Appendix 5. Outlier labeling rule

Calculations of the outlier labeling rule						
	Q1 (Perc 25)		Q3 (Perc 75)	g	Lower limit	Upper limit
Se_total	85		104	2.2	43.2	145.8
TGO_total	25		35	2.2	3	57
PGO_total	14		23	2.2	-5.8	42.8
EGO_total	29		41	2.2	2.6	67.4
Perf_total	9		12	2.2	2.4	18.6

	Q3-Q1	g`
Se_total	19	41.8
TGO_total	10	22
PGO_total	9	19.8
EGO_total	12	26.4
Perf_total	3	6.6

Appendix 6. Percentiles for the consolidated variables

stats	Se_total	TGO_to~l	PGO_to~l	EGO_to~l	Perf_t~l
p1	0	0	0	0	3
p5	60	16	5	11	7
p10	66	21	9	22	8
p25	85	25	14	29	9
p50	95	31	18	37	10
p75	104	35	23	41	12
p90	110	38	26	47	13
p95	112	39	28	48	13

Appendix 7. Skewness and Kurtosis Normality test

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
Se_1	106	0.0002	0.0122	16.24	0.0003
Se_2	106	0.0003	0.1016	12.91	0.0016
Se_3	106	0.0000	0.0000	39.19	0.0000
Se_4	106	0.0000	0.0182	19.93	0.0000
Se_5	106	0.0000	0.0002	31.18	0.0000
Se_6	106	0.0000	0.0010	27.19	0.0000
Se_7	106	0.0000	0.0035	21.77	0.0000
Se_8	106	0.0000	0.0000	45.21	0.0000
Se_9	106	0.0000	0.0000	45.70	0.0000
Se_10	106	0.0000	0.0000	42.82	0.0000
Se_11	106	0.0000	0.0002	33.35	0.0000
Se_12	106	0.0000	0.0177	19.38	0.0001
Per_GO_1	106	0.0000	0.0000	38.89	0.0000
Per_GO_2	106	0.0440	0.1467	5.89	0.0526
Per_GO_3	106	0.0001	0.1831	13.39	0.0012
Per_GO_4	106	0.0000	0.0000	37.38	0.0000
Per_GO_5	106	0.0000	0.0274	17.46	0.0002
Per_GO_6	106	0.0571	0.0005	12.90	0.0016
Per_GO_7	106	0.3174	0.0000	17.04	0.0002
Per_EGO_1	106	0.0000	0.0060	22.97	0.0000
Per_EGO_2	106	0.0001	0.0881	14.38	0.0008
Per_EGO_3	106	0.0009	0.1919	10.77	0.0046
Per_EGO_4	106	0.0000	0.0296	19.58	0.0001
Per_EGO_5	106	0.0000	0.0113	22.73	0.0000
Per_1	106	0.4127	0.3107	1.74	0.4195
Per_2	106	0.0085	0.0974	8.55	0.0139
Per_3	106	0.4451	0.3569	1.46	0.4812

Appendix 8. Shapiro-Milk Normality test

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Se_1	106	0.89100	9.449	4.998	0.00000
Se_2	106	0.94327	4.918	3.545	0.00020
Se_3	106	0.78421	18.706	6.518	0.00000
Se_4	106	0.90513	8.224	4.689	0.00000
Se_5	106	0.86906	11.351	5.406	0.00000
Se_6	106	0.86565	11.647	5.463	0.00000
Se_7	106	0.90971	7.827	4.579	0.00000
Se_8	106	0.74697	21.935	6.872	0.00000
Se_9	106	0.76563	20.317	6.702	0.00000
Se_10	106	0.77384	19.605	6.622	0.00000
Se_11	106	0.82215	15.417	6.088	0.00000
Se_12	106	0.89166	9.391	4.985	0.00000
Per_GO_1	106	0.77679	19.349	6.593	0.00000
Per_GO_2	106	0.97394	2.259	1.814	0.03486
Per_GO_3	106	0.93043	6.031	3.999	0.00003
Per_GO_4	106	0.79101	18.117	6.447	0.00000
Per_GO_5	106	0.91174	7.651	4.529	0.00000
Per_GO_6	106	0.96851	2.730	2.235	0.01271
Per_GO_7	106	0.96629	2.922	2.386	0.00851
Per_EGO_1	106	0.88899	9.623	5.039	0.00000
Per_EGO_2	106	0.93419	5.705	3.875	0.00005
Per_EGO_3	106	0.94869	4.448	3.321	0.00045
Per_EGO_4	106	0.89650	8.972	4.883	0.00000
Per_EGO_5	106	0.88068	10.344	5.199	0.00000
Per_1	106	0.98478	1.320	0.617	0.26855
Per_2	106	0.96436	3.089	2.510	0.00603
Per_3	106	0.99819	0.157	-4.124	0.99998

.

Appendix 9. Skewness/Kurtosis and Shapiro-Wilk tests for normality on transformed variables

```
                    Skewness/Kurtosis tests for Normality
                                                              ------- joint ------
    Variable |     Obs    Pr(Skewness)    Pr(Kurtosis)  adj chi2(2)     Prob>chi2
-------------+------------------------------------------------------------------
       Per_1 |     106      0.0000          0.0000         33.66          0.0000
       Per_2 |     106      0.0085          0.0974          8.55          0.0139
       Per_3 |     106      0.0014          0.0738         11.29          0.0035

. swilk Per_1 Per_2 Per_3

                     Shapiro-Wilk W test for normal data

    Variable |     Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
       Per_1 |     106    0.87516     10.822     5.300    0.00000
       Per_2 |     106    0.96436      3.089     2.510    0.00603
       Per_3 |     106    0.95510      3.892     3.024    0.00125
```

Appendix 10. Multivariate normality tests for model-TGO

```
Test for multivariate normality

    Mardia mSkewness =  294.8174  chi2(2600) = 5367.890   Prob>chi2 =  0.0000
    Mardia mKurtosis =  770.7998     chi2(1) =  457.596   Prob>chi2 =  0.0000
    Henze-Zirkler    =   1.02838     chi2(1) =20298.332   Prob>chi2 =  0.0000
    Doornik-Hansen                 chi2(48) =  260.163   Prob>chi2 =  0.0000
```

Appendix 11. Multivariate normality tests for model-PGO

```
Test for multivariate normality

    Mardia mSkewness =  264.8781  chi2(2300) = 4823.221   Prob>chi2 =  0.0000
    Mardia mKurtosis =  714.4433     chi2(1) =  448.067   Prob>chi2 =  0.0000
    Henze-Zirkler    =  1.029698     chi2(1) =12496.924   Prob>chi2 =  0.0000
    Doornik-Hansen                 chi2(46) =  243.717   Prob>chi2 =  0.0000
```

Appendix 12. Regression analysis and linearity for Self-efficacy with TGO and PGO respectively

```
Equation           Obs  Parms        RMSE    "R-sq"          F         P
----------------------------------------------------------------------
Se_total           106      3    13.82707    0.5328   58.72422    0.0000

------------------------------------------------------------------------------
    Se_total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   TGO_total |   1.627096   .2006404     8.11   0.000     1.229173    2.025019
   EGO_total |   .3457707   .1406551     2.46   0.016     .0668144    .6247269
       _cons |     31.689   5.716385     5.54   0.000      20.3519     43.0261
------------------------------------------------------------------------------

. mvreg Se_total = PGO_total  EGO_total

Equation           Obs  Parms        RMSE    "R-sq"          F         P
----------------------------------------------------------------------
Se_total           106      3    16.78271    0.3117   23.31926    0.0000

------------------------------------------------------------------------------
    Se_total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   PGO_total |   .8159977   .2400439     3.40   0.001     .3399273    1.292068
   EGO_total |   .7629628   .1546271     4.93   0.000     .4562965    1.069629
       _cons |   50.54023   6.183382     8.17   0.000     38.27695    62.80351
------------------------------------------------------------------------------
```

Appendix 13. Regression analysis and linearity for Performance based on Self-efficacy, EGO, TGO and PGO respectively

```
      Source |       SS       df       MS              Number of obs =     106
-------------+------------------------------           F(  3,   102) =   18.80
       Model |  62.8472153     3  20.9490718            Prob > F      =  0.0000
    Residual |  113.643675   102  1.11415368            R-squared     =  0.3561
-------------+------------------------------           Adj R-squared =  0.3372
       Total |   176.49089   105  1.68086562            Root MSE      =  1.0555

------------------------------------------------------------------------------
  Perf_total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Se_total |   .0301282   .0075218     4.01   0.000     .0152087    .0450478
   EGO_total |  -.0000575   .0110479    -0.01   0.996    -.0219709    .0218559
   TGO_total |   .0285082   .0196057     1.45   0.149    -.0103796     .067396
       _cons |   2.286348   .4972342     4.60   0.000     1.300086     3.27261
------------------------------------------------------------------------------

. regress Perf_total Se_total  EGO_total   PGO_total

      Source |       SS       df       MS              Number of obs =     106
-------------+------------------------------           F(  3,   102) =   18.25
       Model |  61.6501764     3  20.5500588            Prob > F      =  0.0000
    Residual |  114.840714   102  1.12588935            R-squared     =  0.3493
-------------+------------------------------           Adj R-squared =  0.3302
       Total |   176.49089   105  1.68086562            Root MSE      =  1.0611

------------------------------------------------------------------------------
  Perf_total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    Se_total |    .038963   .0062297     6.25   0.000     .0266064    .0513196
   EGO_total |   .0041172   .0108704     0.38   0.706    -.0174443    .0256786
   PGO_total |  -.0162366   .0160054    -1.01   0.313    -.0479833      .01551
       _cons |   2.461499   .5019624     4.90   0.000     1.465859    3.457139
------------------------------------------------------------------------------
```

Appendix 14. Regression on self-efficacy using EGO and TGO

```
. hettest  EGO_total TGO_total

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: EGO_total TGO_total

         chi2(2)      =    14.17
         Prob > chi2  =   0.0008
```

Appendix 15. Regression on self-efficacy using EGO and PGO

```
. hettest  EGO_total PGO_total

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: EGO_total PGO_total

         chi2(2)      =    45.46
         Prob > chi2  =   0.0000
```

Appendix 16. Regression on Performance using self-efficacy, TGO, and EGO

```
. hettest  Se_total TGO_total EGO_total

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: Se_total TGO_total EGO_total

         chi2(3)      =    12.28
         Prob > chi2  =   0.0065
```

Appendix 17. Regression on Performance using Self-efficacy, PGO, and EGO

```
. hettest  Se_total PGO_total EGO_total

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: Se_total PGO_total EGO_total

         chi2(3)      =     8.44
         Prob > chi2  =   0.0378
```

Appendix 18. Analysis of multicollinearity for Performance as dependent variable

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
    Se_total |      2.14    0.467229
   TGO_total |      2.12    0.471838
   EGO_total |      1.37    0.730256
-------------+----------------------
    Mean VIF |      1.88
```

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
    Se_total |      1.45    0.688325
   EGO_total |      1.31    0.762237
   PGO_total |      1.18    0.847345
-------------+----------------------
    Mean VIF |      1.31
```

Appendix 19. Analysis of Collinearity for Self-efficacy as dependent variable

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
   EGO_total |      1.29    0.773101
   TGO_total |      1.29    0.773101
-------------+----------------------
    Mean VIF |      1.29
```

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
   EGO_total |      1.06    0.942410
   PGO_total |      1.06    0.942410
-------------+----------------------
    Mean VIF |      1.06
```

Appendix 20. Cronbach's alpha for Self-efficacy construct

```
. alpha Se_1 -Se_12

Test scale = mean(unstandardized items)

Average interitem covariance:     2.642603
Number of items in the scale:           12
Scale reliability coefficient:      0.9480
```

Appendix 21. Cronbach's alpha for TGO and PGO respectively

```
. alpha Per_GO_1 Per_GO_2 Per_GO_3 Per_GO_4

Test scale = mean(unstandardized items)

Average interitem covariance:     2.969437
Number of items in the scale:            4
Scale reliability coefficient:      0.8121

. alpha Per_GO_5 Per_GO_6 Per_GO_7

Test scale = mean(unstandardized items)

Average interitem covariance:     4.157592
Number of items in the scale:            3
Scale reliability coefficient:      0.7575
```

Appendix 22. Cronbach's alpha for EGO

```
. alpha Per_EGO_1- Per_EGO_5

Test scale = mean(unstandardized items)

Average interitem covariance:     4.400854
Number of items in the scale:            5
Scale reliability coefficient:      0.9242
```

Appendix 23. Cronbach's alpha for Perceived Personal Performance

```
Test scale = mean(unstandardized items)

Average interitem covariance:     .1175102
Number of items in the scale:            3
Scale reliability coefficient:      0.6292
```

Appendix 24. Questionnaire and sections

Question's Stata code	***Description of the question (Self-efficacy)***
Se_1	Can I influence customers' decisions related to our product/service
Se_2	Can I influence current or potential investors' decisions to get them to provide necessary resources for developing the business appropriately
Se_3	Can I influence employees' commitment toward reaching the company goals
Se_4	Can I get through to our most difficult employees
Se_5	Can I keep employees on task on difficult assignments
Se_6	Can I motivate employees who show low interest in their work

Se_7	Can I overcome the influence of adverse external conditions on our employees`improvement
Se_8	Can I get our employees to believe they can do well at work
Se_9	Can I get our employees to do their work
Se_10	Can I increase collaboration between employees working in our company
Se_11	Can I make employees enjoy coming to work
Se_12	Can I reduce employees' turnover

Question's Stata code	***Description of the question (TGO)***
Per_GO_1	I like my work, even if I make a lot of mistakes
Per_GO_2	Improving the way I develop my business is more important to me than the results I get
Per_GO_3	The main reason I do my business is because I like those responsibilities associated to it
Per_GO_4	I like the parts of my business which are really challenging

Question's Stata code	***Description of the question (PGO)***
Per_GO_5	I would fell successful in my business if I did better than others
Per_GO_6	I would feel really good if I were the only one who could resolve a problem related to my business
Per_GO_7	I`d like to show that I`m smarter than other business people in my field

Question's Stata code	***Description of the question (EGO)***
Per_EGO_1	My partners/investors/Board help to see how to improve our business
Per_EGO_2	My partners/investors/Board think mistakes are O.K. as long as we are improving
Per_EGO_3	My partners/investors/Board use a lot of ways of helping us to improve in our business
Per_EGO_4	My partners/investors/Board make sure that I get the opportunity to present my view about the business
Per_EGO_5	My partners/investors/Board encourage to find different ways to solve problems of the business

Question's Stata code	***Description of the question (Performance)***
Per_Perf_1	How would you describe your ***overall performance***?

Per_Perf_2	How ***do you think*** your partners/investors/Board describe your overall performance?
Per_Perf_3	How would you describe your business' current ***financial*** situation?

Appendix 25. Factor analysis: Model-TGO, Model-PGO, self-efficacy, TGO, PGO, EGO and Perceived Performance, respectively

```
. factor Se_1 Se_2 Se_3 Se_4 Se_5 Se_6 Se_7 Se_8 Se_9 Se_10 Se_11 Se_12  Per_GO_5 Per_GO_6 P
> er_GO_7 Per_EGO_1 Per_EGO_2 Per_EGO_3 Per_EGO_4 Per_EGO_5 Per_1 Per_2 Per_3
(obs=106)

Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =       14
    Rotation: (unrotated)                         Number of params =      231
```

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	10.13507	7.65260	0.6273	0.6273
Factor2	2.48247	1.10708	0.1537	0.7810
Factor3	1.37539	0.42864	0.0851	0.8661
Factor4	0.94675	0.23229	0.0586	0.9247
Factor5	0.71446	0.35283	0.0442	0.9690
Factor6	0.36163	0.07380	0.0224	0.9913
Factor7	0.28783	0.02389	0.0178	1.0092
Factor8	0.26394	0.06916	0.0163	1.0255
Factor9	0.19478	0.03303	0.0121	1.0376
Factor10	0.16176	0.07039	0.0100	1.0476
Factor11	0.09137	0.03592	0.0057	1.0532
Factor12	0.05545	0.02080	0.0034	1.0567
Factor13	0.03465	0.02874	0.0021	1.0588
Factor14	0.00591	0.01369	0.0004	1.0592
Factor15	-0.00778	0.04193	-0.0005	1.0587
Factor16	-0.04971	0.01184	-0.0031	1.0556
Factor17	-0.06155	0.01518	-0.0038	1.0518
Factor18	-0.07674	0.03556	-0.0047	1.0470
Factor19	-0.11229	0.01601	-0.0070	1.0401
Factor20	-0.12830	0.01743	-0.0079	1.0322
Factor21	-0.14573	0.03317	-0.0090	1.0231
Factor22	-0.17890	0.01597	-0.0111	1.0121
Factor23	-0.19488	.	-0.0121	1.0000

```
    LR test: independent vs. saturated: chi2(253) = 2015.71 Prob>chi2 = 0.0000
```

```
. factor Se_1 Se_2 Se_3 Se_4 Se_5 Se_6 Se_7 Se_8 Se_9 Se_10 Se_11 Se_12
(obs=106)

Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =        7
    Rotation: (unrotated)                         Number of params =       63
```

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	7.64700	6.93168	0.8954	0.8954
Factor2	0.71532	0.42502	0.0838	0.9791
Factor3	0.29030	0.10965	0.0340	1.0131
Factor4	0.18065	0.09407	0.0212	1.0342
Factor5	0.08658	0.01128	0.0101	1.0444
Factor6	0.07530	0.07428	0.0088	1.0532
Factor7	0.00101	0.01287	0.0001	1.0533
Factor8	-0.01186	0.04419	-0.0014	1.0519
Factor9	-0.05605	0.04115	-0.0066	1.0454
Factor10	-0.09719	0.03107	-0.0114	1.0340
Factor11	-0.12826	0.03375	-0.0150	1.0190
Factor12	-0.16201	.	-0.0190	1.0000

```
    LR test: independent vs. saturated:  chi2(66) = 1183.02 Prob>chi2 = 0.0000
```

```
. factor Per_GO_1 Per_GO_2 Per_GO_3 Per_GO_4
(obs=106)

Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =        2
    Rotation: (unrotated)                         Number of params =        6

    Factor  | Eigenvalue   Difference        Proportion   Cumulative
------------+------------------------------------------------------
    Factor1 |     2.07612      2.04020           1.1271       1.1271
    Factor2 |     0.03592      0.07647           0.0195       1.1466
    Factor3 |    -0.04055      0.18896          -0.0220       1.1246
    Factor4 |    -0.22951            .          -0.1246       1.0000

    LR test: independent vs. saturated:  chi2(6)  =  154.20 Prob>chi2 = 0.0000
```

```
Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =        1
    Rotation: (unrotated)                         Number of params =        3

    Factor  | Eigenvalue   Difference        Proportion   Cumulative
------------+------------------------------------------------------
    Factor1 |     1.40155      1.51333           1.2833       1.2833
    Factor2 |    -0.11178      0.08586          -0.1024       1.1810
    Factor3 |    -0.19764            .          -0.1810       1.0000

    LR test: independent vs. saturated:  chi2(3)  =   80.56 Prob>chi2 = 0.0000
```

```
. factor Per_EGO_1 Per_EGO_2 Per_EGO_3 Per_EGO_4 Per_EGO_5
(obs=106)

Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =        2
    Rotation: (unrotated)                         Number of params =        9

    Factor  | Eigenvalue   Difference        Proportion   Cumulative
------------+------------------------------------------------------
    Factor1 |     3.52895      3.41365           1.0366       1.0366
    Factor2 |     0.11530      0.16155           0.0339       1.0705
    Factor3 |    -0.04625      0.03952          -0.0136       1.0569
    Factor4 |    -0.08577      0.02211          -0.0252       1.0317
    Factor5 |    -0.10788            .          -0.0317       1.0000

    LR test: independent vs. saturated:  chi2(10) =  408.66 Prob>chi2 = 0.0000
```

```
. factor Per_1 Per_2 Per_3
(obs=106)

Factor analysis/correlation                       Number of obs    =      106
    Method: principal factors                     Retained factors =        1
    Rotation: (unrotated)                         Number of params =        3

    Factor  | Eigenvalue   Difference        Proportion   Cumulative
------------+------------------------------------------------------
    Factor1 |     1.31104      1.43836           1.3282       1.3282
    Factor2 |    -0.12731      0.06935          -0.1290       1.1992
    Factor3 |    -0.19666            .          -0.1992       1.0000

    LR test: independent vs. saturated:  chi2(3)  =   70.70 Prob>chi2 = 0.0000
```

Appendix 26. SEM results Model-TGO

Structural equation model — Number of obs = 106
Estimation method = ml
Log likelihood = -4010.6577

(1) [Se_1]Self_eff = 1
(2) [Per_1]Per_Perf = 1
(3) [Per_GO_1]Per_TGO = 1
(4) [Per_EGO_1]Per_EGO = 1
(5) [cov(Per_TGO,Per_EGO)]_cons = 0

	OIM Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
Self_eff <-						
Per_TGO	.5699906	.0984341	5.79	0.000	.3770632	.7629179
Per_EGO	.0590267	.049413	1.19	0.232	-.0378209	.1558743
Per_Perf <-						
Self_eff	.0527147	.0180948	2.91	0.004	.0172495	.0881798
Per_TGO	.0004735	.012641	0.04	0.970	-.0243024	.0252493
Per_EGO	.0070273	.0055546	1.27	0.206	-.0038595	.0179141
Measurement						
Se_1 <-						
Self_eff	1	(constrained)				
_cons	7.528302	.1954694	38.51	0.000	7.145189	7.911415
Se_2 <-						
Self_eff	1.033671	.2006666	5.15	0.000	.6403716	1.42697
_cons	6.59434	.2263517	29.13	0.000	6.150698	7.037981
Se_3 <-						
Self_eff	1.2823	.178671	7.18	0.000	.9321113	1.632489
_cons	8.132075	.1784666	45.57	0.000	7.782287	8.481864
Se_4 <-						
Self_eff	1.249695	.2046293	6.11	0.000	.8486294	1.650761
_cons	7.103774	.2172877	32.69	0.000	6.677898	7.52965
Se_5 <-						
Self_eff	1.191593	.177739	6.70	0.000	.8432307	1.539955
_cons	7.481132	.1826091	40.97	0.000	7.123225	7.839039
Se_6 <-						
Self_eff	1.4547	.2086309	6.97	0.000	1.045791	1.863609
_cons	7.518868	.2081757	36.12	0.000	7.110851	7.926885
Se_7 <-						

Se_6 <-						
Self_eff	1.4547	.2086309	6.97	0.000	1.045791	1.863609
_cons	7.518868	.2081757	36.12	0.000	7.110851	7.926885
Se_7 <-						
Self_eff	1.284034	.1948219	6.59	0.000	.9021901	1.665878
_cons	7.037736	.200462	35.11	0.000	6.644837	7.430634
Se_8 <-						
Self_eff	1.302214	.1757744	7.41	0.000	.9577023	1.646725
_cons	8.311321	.1708234	48.65	0.000	7.976513	8.646128
Se_9 <-						
Self_eff	1.308392	.1727289	7.57	0.000	.9698496	1.646935
_cons	8.169811	.1660783	49.19	0.000	7.844304	8.495319
Se_10 <-						
Self_eff	1.466773	.196909	7.45	0.000	1.080838	1.852707
_cons	8.122642	.1894999	42.86	0.000	7.751229	8.494054
Se_11 <-						
Self_eff	1.53702	.2127437	7.22	0.000	1.12005	1.95399
_cons	7.896226	.2078886	37.98	0.000	7.488772	8.303681
Se_12 <-						
Self_eff	1.29533	.2112931	6.13	0.000	.8812035	1.709457
_cons	7.377358	.2240942	32.92	0.000	6.938142	7.816575
Per_GO_1 <-						
Per_TGO	1	(constrained)				
_cons	8.160377	.2139396	38.14	0.000	7.741063	8.579691
Per_GO_2 <-						
Per_TGO	.888445	.1470403	6.04	0.000	.6002514	1.176639
_cons	6.141509	.2619309	23.45	0.000	5.628134	6.654885
Per_GO_3 <-						
Per_TGO	.9110992	.1347068	6.76	0.000	.6470788	1.17512
_cons	6.924528	.2494915	27.75	0.000	6.435534	7.413523
Per_GO_4 <-						
Per_TGO	.9348976	.1017608	9.19	0.000	.7354501	1.134345
_cons	8.09434	.19266	42.01	0.000	7.716733	8.471946

Per_EGO_1 <-						
Per_EGO	1	(constrained)				
_cons	7.132075	.2322654	30.71	0.000	6.676844	7.587307
Per_EGO_2 <-						
Per_EGO	.9639652	.1084295	8.89	0.000	.7514473	1.176483
_cons	6.5	.2357547	27.57	0.000	6.037929	6.962071
Per_EGO_3 <-						
Per_EGO	1.163857	.1057603	11.00	0.000	.9565702	1.371143
_cons	6.45283	.2456934	26.26	0.000	5.97128	6.93438
Per_EGO_4 <-						
Per_EGO	1.112114	.1139242	9.76	0.000	.8888262	1.335401
_cons	7.198113	.2476015	29.07	0.000	6.712823	7.683403
Per_EGO_5 <-						
Per_EGO	1.183294	.1083684	10.92	0.000	.9708957	1.395692
_cons	7.066038	.2424616	29.14	0.000	6.590822	7.541254
Per_1 <-						
Per_Perf	1	(constrained)				
_cons	.5184546	.011384	45.54	0.000	.4961424	.5407669
Per_2 <-						
Per_Perf	5.853338	.8978833	6.52	0.000	4.093519	7.613157
_cons	3.622642	.0829971	43.65	0.000	3.45997	3.785313
Per_3 <-						
Per_Perf	.9752771	.1592646	6.12	0.000	.6631242	1.28743
_cons	.4576333	.0146441	31.25	0.000	.4289313	.4863353
Variance						
e.Se_1	2.578204	.3620339			1.957901	3.395032
e.Se_2	3.858262	.5376732			2.936104	5.070047
e.Se_3	.955944	.1440131			.7115392	1.284299
e.Se_4	2.705996	.3834793			2.049743	3.572357
e.Se_5	1.444781	.209462			1.087417	1.919587
e.Se_6	1.479026	.2198005			1.105293	1.979129
e.Se_7	1.832872	.2635957			1.382662	2.429675
e.Se_8	.5972031	.09582			.4360623	.8178912
e.Se_9	.404007	.0706212			.286812	.5690894
e.Se_10	.6398605	.1062936			.4620445	.8861084
e.Se_11	1.103875	.1701536			.8160444	1.493227
e.Se_12	2.853502	.4037587			2.162403	3.765474
e.Per_GO_1	1.652184	.3139273			1.138475	2.39769
e.Per_GO_2	4.746989	.7051668			3.547904	6.351327
e.Per_GO_3	3.942205	.6054714			2.917466	5.326878
e.Per_GO_4	1.138066	.2377514			.7556915	1.71392
e.Per_EGO_1	2.001628	.3274569			1.452549	2.758265
e.Per_EGO_2	2.437773	.3756916			1.802239	3.297419
e.Per_EGO_3	1.364113	.2744519			.9195882	2.023519
e.Per_EGO_4	1.90159	.329695			1.353745	2.671143
e.Per_EGO_5	1.027315	.2446475			.644164	1.638367
e.Per_1	.0040942	.0012153			.0022882	.0073256
e.Per_2	.3997997	.0693654			.2845501	.5617282
e.Per_3	.0135597	.0022427			.0098055	.0187513
e.Self_eff	.419455	.1396902			.2183793	.8056737
e.Per_Perf	.005115	.0012899			.0031202	.0083851
Per_TGO	3.199454	.6630707			2.131418	4.802674
Per_EGO	3.716777	.7569827			2.493476	5.540228
Covariance						
Per_TGO						
Per_EGO	0	(constrained)				

LR test of model vs. saturated: chi2(247) = 598.69, Prob > chi2 = 0.0000

Appendix 27. SEM's results Model-PGO

```
Structural equation model                       Number of obs      =       106
Estimation method  = ml
Log likelihood     = -3890.6633

 ( 1)  [Se_1]Self_eff = 1
 ( 2)  [Per_1]Per_Perf = 1
 ( 3)  [Per_GO_5]Per_PGO = 1
 ( 4)  [Per_EGO_1]Per_EGO = 1
 ( 5)  [cov(Per_PGO,Per_EGO)]_cons = 0
```

	OIM Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
Self_eff <-						
Per_PGO	.2628616	.0906789	2.90	0.004	.0851342	.440589
Per_EGO	.2719562	.0696394	3.91	0.000	.1354654	.408447
Per_Perf <-						
Self_eff	.0563105	.0114413	4.92	0.000	.0338859	.0787352
Per_PGO	-.0063739	.0075255	-0.85	0.397	-.0211236	.0083757
Per_EGO	.0071787	.0055593	1.29	0.197	-.0037172	.0180747
Measurement						
Se_1 <-						
Self_eff	1	(constrained)				
_cons	7.528302	.1961069	38.39	0.000	7.143939	7.912664
Se_2 <-						
Self_eff	1.042636	.203131	5.13	0.000	.6445064	1.440765
_cons	6.59434	.2269142	29.06	0.000	6.149596	7.039083
Se_3 <-						
Self_eff	1.287214	.1814618	7.09	0.000	.9315552	1.642872
_cons	8.132075	.1795953	45.28	0.000	7.780075	8.484076
Se_4 <-						
Self_eff	1.258356	.2076133	6.06	0.000	.8514411	1.66527
_cons	7.103774	.2181527	32.56	0.000	6.676202	7.531345
Se_5 <-						
Self_eff	1.199868	.1805417	6.65	0.000	.8460123	1.553723
_cons	7.481132	.1835443	40.76	0.000	7.121392	7.840872
Se_6 <-						
Self_eff	1.475822	.2126916	6.94	0.000	1.058954	1.89269
_cons	7.518868	.2093408	35.92	0.000	7.108568	7.929168
Se_7 <-						
Self_eff	1.299686	.1981956	6.56	0.000	.91123	1.688143
_cons	7.037736	.2014194	34.94	0.000	6.642961	7.432511
Se_8 <-						
Self_eff	1.303811	.1785089	7.30	0.000	.9539405	1.653682
_cons	8.311321	.1720581	48.31	0.000	7.974093	8.648548
Se_9 <-						
Self_eff	1.314499	.1756775	7.48	0.000	.970177	1.65882
_cons	8.169811	.1673339	48.82	0.000	7.841843	8.49778
Se_10 <-						
Self_eff	1.479333	.200603	7.37	0.000	1.086158	1.872508
_cons	8.122642	.1908504	42.56	0.000	7.748582	8.496701
Se_11 <-						
Self_eff	1.554186	.2168262	7.17	0.000	1.129215	1.979158
_cons	7.896226	.209219	37.74	0.000	7.486165	8.306288
Se_12 <-						
Self_eff	1.302441	.2143107	6.08	0.000	.8823995	1.722482
_cons	7.377358	.2250033	32.79	0.000	6.93636	7.818357

Per_GO_5 <-						
Per_PGO	1	(constrained)				
_cons	7.150943	.2302322	31.06	0.000	6.699697	7.60219
Per_GO_6 <-						
Per_PGO	1.568967	.3075469	5.10	0.000	.9661862	2.171748
_cons	5.773585	.3063593	18.85	0.000	5.173132	6.374038
Per_GO_7 <-						
Per_PGO	1.472196	.2739741	5.37	0.000	.935217	2.009176
_cons	4.877358	.2857425	17.07	0.000	4.317313	5.437404
Per_EGO_1 <-						
Per_EGO	1	(constrained)				
_cons	7.132075	.2322654	30.71	0.000	6.676844	7.587307
Per_EGO_2 <-						
Per_EGO	.9609795	.1082242	8.88	0.000	.7488639	1.173095
_cons	6.5	.2357547	27.57	0.000	6.037929	6.962071
Per_EGO_3 <-						
Per_EGO	1.163336	.1054336	11.03	0.000	.9566901	1.369982
_cons	6.45283	.2456934	26.26	0.000	5.97128	6.93438
Per_EGO_4 <-						
Per_EGO	1.115563	.1131079	9.86	0.000	.8938752	1.33725
_cons	7.198113	.2476015	29.07	0.000	6.712823	7.683403
Per_EGO_5 <-						
Per_EGO	1.179203	.1073093	10.99	0.000	.9688802	1.389525
_cons	7.066038	.2424616	29.14	0.000	6.590822	7.541254
Per_1 <-						
Per_Perf	1	(constrained)				
_cons	.5184546	.0116935	44.34	0.000	.4955358	.5413735
Per_2 <-						
Per_Perf	5.847056	.9001728	6.50	0.000	4.08275	7.611362
_cons	3.622642	.0844622	42.89	0.000	3.457099	3.788184
Per_3 <-						
Per_Perf	.9791003	.1597469	6.13	0.000	.6660022	1.292198
_cons	.4576333	.0148743	30.77	0.000	.4284802	.4867864

Variance				
e.Se_1	2.599266	.3652586	1.973498	3.423456
e.Se_2	3.852017	.5372238	2.930724	5.062926
e.Se_3	.9712538	.1467454	.7223138	1.305989
e.Se_4	2.705404	.3837959	2.0487	3.572612
e.Se_5	1.444179	.2098029	1.086332	1.919902
e.Se_6	1.427722	.2137498	1.06465	1.91461
e.Se_7	1.805009	.2604124	1.360426	2.394882
e.Se_8	.6267695	.1003332	.4579811	.8577647
e.Se_9	.4154788	.0729975	.2944402	.586274
e.Se_10	.6280287	.1054949	.4518523	.872896
e.Se_11	1.071548	.1666666	.7899827	1.45347
e.Se_12	2.860432	.405198	2.166974	3.775806
e.Per_GO_5	3.296401	.5976773	2.310505	4.70298
e.Per_GO_6	4.231969	1.018893	2.640015	6.783886
e.Per_GO_7	3.621452	.8638958	2.268971	5.780115
e.Per_EGO_1	1.994977	.3239513	1.451166	2.742578
e.Per_EGO_2	2.452992	.3764711	1.815761	3.313856
e.Per_EGO_3	1.359614	.2687631	.9228974	2.002985
e.Per_EGO_4	1.864756	.3241015	1.326417	2.621585
e.Per_EGO_5	1.053992	.2387084	.6761718	1.642925
e.Per_1	.0041075	.0012174	.0022977	.0073427
e.Per_2	.4010854	.0691504	.2860769	.5623296
e.Per_3	.0134948	.0022348	.0097545	.0186692
e.Self_eff	1.041424	.3089845	.5822114	1.862834
e.Per_Perf	.0050358	.001289	.0030493	.0083166
Per_PGO	2.322324	.7367716	1.247022	4.324857
Per_EGO	3.723428	.7561364	2.500834	5.543716
Covariance				
Per_PGO				
Per_EGO	0	(constrained)		

LR test of model vs. saturated: chi2(225) = 492.48, Prob > chi2 = 0.0000

Appendix 28. Fit Indices Model-TGO

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(247)	598.691	model vs. saturated
p > chi2	0.000	
chi2_bs(276)	2453.489	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.116	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	.	
pclose	.	Probability RMSEA <= 0.05
Information criteria		
AIC	8175.315	Akaike's information criterion
BIC	8380.400	Bayesian information criterion
Baseline comparison		
CFI	0.838	Comparative fit index
TLI	0.820	Tucker-Lewis index
Size of residuals		
SRMR	0.168	Standardized root mean squared residual
CD	0.993	Coefficient of determination

Appendix 29. Fit Indices Model-PGO

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(225)	492.481	model vs. saturated
p > chi2	0.000	
chi2_bs(253)	2218.793	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.106	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	.	
pclose	.	Probability RMSEA <= 0.05
Information criteria		
AIC	7929.327	Akaike's information criterion
BIC	8126.421	Bayesian information criterion
Baseline comparison		
CFI	0.864	Comparative fit index
TLI	0.847	Tucker-Lewis index
Size of residuals		
SRMR	0.095	Standardized root mean squared residual
CD	0.986	Coefficient of determination

Appendix 30. Modification Indices Model-TGO

Modification indices

	MI	df	P>MI	EPC	Standard EPC
Structural					
Self_eff <-					
Se_11	4.441	1	0.04	.2082279	.3673563
Per_EGO_5	13.129	1	0.00	-.3420055	-.7037101
Per_Perf <-					
Per_GO_3	4.279	1	0.04	.0095053	.2486385

Covariance					
e.Se_1					
e.Se_2	28.984	1	0.00	1.676633	.5315982
e.Se_3	12.601	1	0.00	.5720343	.3643738
e.Se_6	6.312	1	0.01	-.49958	-.2558342
e.Se_10	5.130	1	0.02	-.3133286	-.2439488
e.Se_11	15.081	1	0.00	-.6805181	-.4033863
e.Per_GO_2	4.211	1	0.04	-.726063	-.2075423
e.Per_GO_3	4.345	1	0.04	.6779641	.2126564
e.Per_EGO_3	4.390	1	0.04	-.4412849	-.2353072
e.Per_EGO_5	7.325	1	0.01	.5262495	.3233562
e.Per_2	4.067	1	0.04	.217104	.2138395
e.Se_2					
e.Se_3	3.914	1	0.05	.3886085	.2023486
e.Se_6	5.264	1	0.02	-.5562194	-.2328426
e.Per_EGO_1	9.193	1	0.00	-.8780001	-.3159417
e.Per_EGO_4	7.934	1	0.00	.8118737	.2997327
e.Per_2	5.149	1	0.02	.2980465	.2399755
e.Se_3					
e.Se_6	7.202	1	0.01	-.3390297	-.285124
e.Per_EGO_3	5.893	1	0.02	-.321637	-.2816596
e.Se_4					
e.Se_5	9.679	1	0.00	.6221863	.3146704
e.Se_8	9.878	1	0.00	-.4266126	-.33559
e.Per_GO_3	3.896	1	0.05	.6607382	.2023002
e.Per_EGO_1	7.100	1	0.01	-.6508066	-.2796383
e.Per_EGO_3	11.732	1	0.00	.7423619	.3863909
e.Se_5					
e.Se_6	5.099	1	0.02	.3424109	.2342387
e.Se_8	5.577	1	0.02	-.2379493	-.2561665
e.Per_GO_4	6.718	1	0.01	.3900267	.3041652
e.Se_6					
e.Se_7	6.234	1	0.01	.4252898	.258304
e.Se_10	5.699	1	0.02	.2613744	.2686782
e.Per_2	11.147	1	0.00	-.2794199	-.3633693
e.Se_7					
e.Per_GO_1	8.806	1	0.00	-.5810658	-.3339105
e.Per_GO_2	6.690	1	0.01	.7813143	.2648809
e.Per_EGO_2	4.980	1	0.03	.4910442	.2323047
e.Se_8					
e.Se_9	7.337	1	0.01	.166557	.339084
e.Per_2	8.096	1	0.00	.1570779	.3214643
e.Se_9					
e.Per_GO_2	8.462	1	0.00	-.4514669	-.3260036
e.Per_GO_4	5.847	1	0.02	.211475	.3118752
e.Per_EGO_1	7.287	1	0.01	.28044	.3118558
e.Se_10					
e.Per_GO_1	8.416	1	0.00	.3594242	.349571
e.Per_GO_4	8.532	1	0.00	-.3128865	-.3666573
e.Per_EGO_3	5.192	1	0.02	.2579259	.276075
e.Per_EGO_4	8.030	1	0.00	.3598012	.3261831
e.Se_11					
e.Se_12	5.665	1	0.02	.4418168	.2489392
e.Per_EGO_3	6.199	1	0.01	.3583211	.292003
e.Per_EGO_5	6.389	1	0.01	-.3358645	-.3153932
e.Self_eff	4.441	1	0.04	.2298568	.3377962

e.Per_GO_1					
e.Per_EGO_1	5.362	1	0.02	-.4938479	-.2715641
e.Per_EGO_2	6.865	1	0.01	-.6068711	-.3023922
e.Per_EGO_5	16.927	1	0.00	.7198779	.5525579
e.Per_GO_2					
e.Per_GO_3	7.049	1	0.01	1.225875	.2833788
e.Per_GO_3					
e.Per_EGO_1	4.522	1	0.03	-.6436291	-.229126
e.Per_2	7.222	1	0.01	.3695365	.2943517
e.Per_Perf	4.279	1	0.04	.0374718	.2638827
e.Per_EGO_1					
e.Per_EGO_3	5.337	1	0.02	.5180621	.3135198
e.Per_EGO_5	4.124	1	0.04	-.4435565	-.3093181
e.Per_1	6.190	1	0.01	.030514	.3370737
e.Per_2	8.028	1	0.00	-.2839751	-.3174441
e.Per_EGO_2					
e.Per_EGO_4	4.967	1	0.03	-.5635401	-.2617398
e.Per_EGO_4					
e.Per_EGO_5	20.585	1	0.00	1.053943	.7540617
e.Per_EGO_5					
e.Per_2	3.934	1	0.05	.1630796	.2544641
e.Self_eff	13.129	1	0.00	-.3513478	-.5352327
Per_TGO					
Per_EGO	27.290	1	0.00	1.9642	.5695929

EPC = expected parameter change

Appendix 31. Modification Indices Model-PGO

Modification indices

	MI	df	P>MI	EPC	Standard EPC
Structural					
Self_eff <-					
Se_4	6.505	1	0.01	-.3167192	-.5852718
Se_5	7.348	1	0.01	-.4659242	-.7244006
Per_GO_5	9.653	1	0.00	.2043117	.3984574
Per_EGO_5	4.531	1	0.03	-.2691209	-.55273
Per_Perf <-					
Per_GO_6	6.993	1	0.01	-.0141329	-.4373958

Covariance					
e.Se_1					
e.Se_2	29.110	1	0.00	1.686715	.5330552
e.Se_3	13.290	1	0.00	.5953221	.3746798
e.Se_6	6.600	1	0.01	-.5060131	-.2626725
e.Se_10	4.797	1	0.03	-.3036035	-.2376248
e.Se_11	15.277	1	0.00	-.6813005	-.4082324
e.Per_EGO_3	4.503	1	0.03	-.4476607	-.2381309
e.Per_EGO_5	7.612	1	0.01	.5404993	.3265511
e.Per_2	4.561	1	0.03	.2311264	.2263632
e.Se_2					
e.Se_3	3.921	1	0.05	.3923028	.2028201
e.Se_6	6.008	1	0.01	-.5857807	-.2497866
e.Se_11	4.124	1	0.04	-.4293251	-.2113179
e.Per_EGO_1	9.533	1	0.00	-.8918797	-.3217312
e.Per_EGO_4	8.169	1	0.00	.8167671	.3047495
e.Per_2	5.331	1	0.02	.3034393	.2441234
e.Se_3					
e.Se_6	8.172	1	0.00	-.3598517	-.3055873
e.Per_EGO_3	6.707	1	0.01	-.3452981	-.3004831
e.Se_4					
e.Se_5	9.703	1	0.00	.6239656	.3156706
e.Se_8	8.678	1	0.00	-.4094088	-.3144034
e.Per_EGO_1	7.248	1	0.01	-.6565645	-.2826131
e.Per_EGO_3	11.620	1	0.00	.7372928	.384429
e.Self_eff	6.506	1	0.01	-.8568553	-.5104788
e.Se_5					
e.Se_6	4.614	1	0.03	.3217599	.2240782
e.Se_8	4.606	1	0.03	-.2215267	-.2328422
e.Self_eff	7.348	1	0.01	-.6728797	-.5486726
e.Se_6					
e.Se_7	5.349	1	0.02	.3865346	.2407835
e.Se_10	4.344	1	0.04	.2254629	.2381022
e.Per_2	10.493	1	0.00	-.2675489	-.3535597
e.Se_7					
e.Per_EGO_2	4.857	1	0.03	.4829859	.2295338
e.Se_8					
e.Se_9	9.877	1	0.00	.2007832	.3934586
e.Per_2	9.011	1	0.00	.1696835	.3384287
e.Se_9					
e.Per_EGO_1	6.178	1	0.01	.2616434	.2873865
e.Se_10					
e.Per_EGO_3	4.339	1	0.04	.2344704	.2537409
e.Per_EGO_4	8.682	1	0.00	.369904	.3418127
e.Se_11					
e.Se_12	5.606	1	0.02	.4362205	.2491635
e.Per_EGO_3	5.503	1	0.02	.3333099	.2761433
e.Per_EGO_5	5.394	1	0.02	-.3064706	-.2883794

e.Per_GO_5					
e.Per_GO_6	5.266	1	0.02	-2.481415	-.6643671
e.Self_eff	9.653	1	0.00	.6734933	.3634959
e.Per_GO_6					
e.Per_GO_7	7.334	1	0.01	5.005841	1.278688
e.Per_Perf	6.993	1	0.01	-.05981	-.4097003
e.Per_GO_7					
e.Per_EGO_2	4.961	1	0.03	.8091966	.2714967
e.Per_EGO_1					
e.Per_EGO_3	5.058	1	0.02	.4986729	.3027882
e.Per_1	6.281	1	0.01	.0306846	.3389728
e.Per_2	8.102	1	0.00	-.2850347	-.3186474
e.Per_EGO_2					
e.Per_EGO_4	5.214	1	0.02	-.5731085	-.2679648
e.Per_EGO_4					
e.Per_EGO_5	18.790	1	0.00	.9869911	.7040177
e.Per_EGO_5					
e.Self_eff	4.531	1	0.03	-.2836514	-.2707401
Per_PGO					
Per_EGO	5.065	1	0.02	.7550861	.2567814

EPC = expected parameter change

.

Appendix 32. Fit Indices Modicated Model-TGO

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(200)	405.008	model vs. saturated
p > chi2	0.000	
chi2_bs(231)	2253.643	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.098	Root mean squared error of approximation
90% CI, lower bound	0.085	
upper bound	0.112	
pclose	0.000	Probability RMSEA <= 0.05
Information criteria		
AIC	7184.007	Akaike's information criterion
BIC	7383.765	Bayesian information criterion
Baseline comparison		
CFI	0.899	Comparative fit index
TLI	0.883	Tucker-Lewis index
Size of residuals		
SRMR	0.063	Standardized root mean squared residual
CD	0.989	Coefficient of determination

Appendix 33. Fit Indices Modicated Model-PGO

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(201)	375.275	model vs. saturated
p > chi2	0.000	
chi2_bs(231)	2106.012	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.090	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	.	
pclose	.	Probability RMSEA <= 0.05
Information criteria		
AIC	7442.558	Akaike's information criterion
BIC	7639.652	Bayesian information criterion
Baseline comparison		
CFI	0.907	Comparative fit index
TLI	0.893	Tucker-Lewis index
Size of residuals		
SRMR	0.093	Standardized root mean squared residual
CD	0.984	Coefficient of determination

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