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The Relationship Between Stress Levels and Study Forms in University

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Title

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Abstract

This study examines how two common ways of studying, mandatory Group study and Individual study, affects students' mental health. 45 Swedish University students were scouted on the web and linked to an online questionnaire where they rated themselves during two conditions: working in group projects and working individually. A Student's t-test showed a strong significant difference between stress levels during Group study and Individual study, with Group study generating higher levels of distress among the participants. These findings are relevant to the discourse of stress and stressors in the educational environment as well as in work settings.

Keywords

University, group study, individual study, psychology, stress, work methods, study forms

The Public Health Agency of Sweden published a report in 2018 about the psychological health of students, which indicated that 25% considered themselves to be experiencing high levels of distress related to studying and life in general (Folkhälsomyndigheten, 2018). Students and their perceived stress have been studied extensively within numeral countries and study programs. What they have in common is the reported levels of negative stress tied to studying which transcends study major and nationality. (Al-Sowygh, Alfadley, Al-Saif & Al-Wadei, 2013, Campbell, Svenson & Jarvis, 1992). This is indicative of stress and studying being a generalized phenomenon. Although, in these studies focus has been on factors such as the economic situation or social support outside of University, giving us an estimation of influence on well-being or what could lead to consequences such as dropping out (Aherne, 2001).

A student's life isn't all about their social connections and financial situation. Being a student means that the work methods themselves, the study forms, are a major aspect of daily life and inevitably will impact well-being. These study forms are considered established and each student in University is expected to be well versed in both studying alone and in Group projects (Hillyard, Gillespie & Littig, 2010). Especially mandatory Group study is both popular and controversial. Group study rests on the idea of promoting social skills and behavior, creativity, critical thinking, and experiential learning. (Barfield, 2003). The ability to cooperate in a team is also considered a necessity in today's workforce as it's said to produce a better product and simplify the work process (Al-Nashash & Gunn, 2016). Yet research about dynamics and performance during Group study, compared to Individual study, tells us about the mixed grade results and attitudes of students (Barfield, 2003). This is due to conditions such as uneven task distribution, poor management and past negative experiences with Group study, making the work more difficult and less rewarding (Walker, 2001). Students also seem to not be aware of research supporting Group study, as well as the reasons behind the chosen study form (Hillyard et al, 2010).

Individual study is the most common study form and demands personal discipline and motivation. The students rely on themselves to understand and implement the knowledge given with minimal outside help. Despite the increased personal effort there seems to be a preference for it. A study done by Rabia, Mubarak, Tallat and Nasir (2017) shows that a majority of students agree that studying alone is better for performance (63%). This corresponds with other studies pointing to better results and more knowledge gained when studying individually (Al-Nashash et al, 2016).

Past research does mention studying itself as a stressor for students (Folkhälsomyndigheten, 2018, Al-Sowygh, Alfadley, Al-Saif & Al-Wadei, 2013, Campbell, Svenson & Jarvis, 1992). Yet stress levels associated specifically with the study forms of Group study and Individual study appears not to have been taken into account, based on the lack of results when performing an online search. Therefore, study forms and stress levels are of interest to analyze, as the study forms, especially Group study with its mixed reviews, could potentially add to the overall stress experienced by students. With this in mind, this study's hypothesis was formulated:

- Stress levels experienced during Group study are higher than during Individual study.

Selye (1978) defined stress as the body's reaction to challenges and involves mobilization of energy. This mobilization happens to make the person adapt to a challenge. When a person fails to adapt properly the stress reaction may become problematic and cause illness. What we call stress is a manifestation of a syndrome, meaning it is a reaction triggered by *stressors* - stimulations extrinsic to the individual. Stress itself is therefore not a culprit but the stressors which may cause unhealthy reactions.

Stress can be both negative and positive. Selye (1978) used the term *distress* to indicate negative stress, which produces a mental and physical overreaction. Distress is a major health issue linked to conditions such as anxiety, diabetes, and a weakened immune system. The link between distress and health issues is supported by the public health agency report with results pointing to students having symptoms of fatigue, anxiety and depression (Folkhälsomyndigheten, 2018). Positive stress, what Selye (1978) labeled *eustress*, makes us take action. It acts as a motivator and induces performance. Stimuli such as deadlines and goals are stressors and can provoke eustress. Although, when people experience a mental overload caused by the stressors then the stress becomes negative.

Since stress is a human reaction to stressors according to Selye (1978), it can be generalized. However, the Swedish Stress Research Institute (2015a) mentions an alternative stress theory by Mason, which states that there is no common stressor that applies to all. All stressful situations should be examined and analyzed individually, meaning that searching for general stressors in the form of study forms would be considered unfruitful

The Job Demand-Control-Support model (JDCS) is used by The Swedish Stress Research Institute (2015b) in their longitudinal studies about work environment and health. The model was introduced by Karasek and further developed by Theorell and Johnson in the field of occupational psychology. It employs the notion of distress and eustress in its measurements with strain being stressors. Several interdisciplinary studies have reported high job strain being related to the risk of self-reported mental health problems. Understanding these risk factors means interventions may be successfully developed and utilized (Gatchel & Schultz, 2012, chapter 6).

By this model, job demands, job control, and worksite social integration are vital factors influencing health (Tausig & Fenwick, 2011, chapter 1). The effects of psychological demands are connected to the level of control (autonomy), and examines whether the worker has room for decision making. Another component of control is *skill discretion* or *intellectual discretion* which checks for the scope of skill and intellectual activity and the potential for personal development (Stressforskningsinstitutet, 2015b). Job demand levels take into account how difficult and stimulating the tasks are. If the tasks are perceived as physically or mentally repetitive, meaningless and uninspiring then distress is a risk (Gatchel et al, 2012, chapter 6). Ideally, the worker is given high support, high control over their work situation and low or high demands (Figure 1).

Social support focuses on trust among coworkers and emotional integration. Two hypotheses emerge to explain the interactions in Karasek's model. According to the *ISO-*

strain hypothesis, jobs with high demands, low control, and low support increase the risk for serious health issues to develop in workers (Figure 1). *The buffer hypothesis* of the JDCS model states that social support, practical or emotional from colleagues and supervisors, may lower the negative impact of high strain (Tausig & Fenwick, 2011, chapter 1, Gatchel et al, 2012, chapter 1).

The JDCS model uses modes to indicate level of strain and level of action; low strain-high strain and passive-active. Low strain jobs are occupations where the worker doesn't typically deal with short deadlines, fast results, and other psychological demands. High strain is the opposite. Passive work tends to lack goals and similar motivators, which may cause disengagement. Active keeps the worker mentally and physically alert (Gatchel et al, 2012, chapter 5).

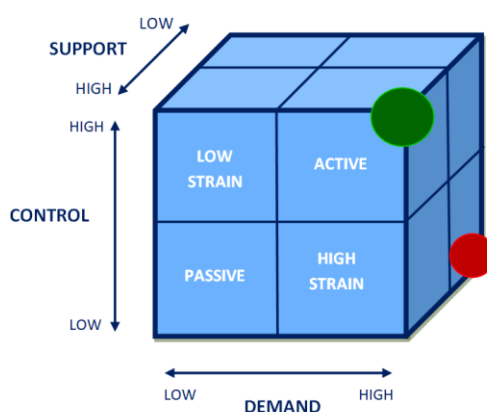


Figure 1. The Job Demand-Control-Support model.

The Karolinska Institute (2012) applies Karasek's model when listing three dimensions of stressors among students in higher education.

- *Demands*. Stimulating and interesting tasks for the student makes a large amount of studying possible and triggers healthy stress. Yet the concentrated studying requires to be followed by a time of rest. Difficult tasks have the same effect, as long as they are considered viable.
- *Control*. The opportunity for the student to directly influence the study situation and choices. Less control and room for decisions increases the risk of distress.
- *Support*. Sufficient support from classmates and educators can compensate for negative stressors, such as a demanding curriculum and complicated tasks, making support a key factor in psychological well-being.

Karasek's model becomes relevant as a complement when examining the stress levels during study forms (which are work methods) in order to test their impact on University students as stressors. The model uses a wide, mainly objective, perspective on job strain based on the characteristics of the job instead of subjective reactions of workers. Yet according to Tausig et al (2011, chapter 1), a majority of past studies have used this model to test and report subjective strain. This indicates the model's flexibility as both an objective and subjective tool to predict job strain. The JDCS model was used in Sonmark and Modin's (2017) study in order to analyze the somatic health complaints of younger students in relation to school and proved to be a useful tool in that context.

METHOD

Participants

The number of participants needed was calculated with the program *G*power* (Faul, Erdfelder, Lang & Buchner, 2007) with a result of 45 participants. No participant was excluded. A demographic of 7 men and 37 women answered the questionnaire. A third gender option of *other* had been added yet no participant identified as such. The average participant age was 32 ($SD = 8.87$).

The study was conducted according to the ethical guidelines established by the Swedish Research Council (Vetenskapsrådet, 2009).

Instrument

Stress in psychological studies is measured using reliable self-rating tests, such as the *Perceived Stress Scale* (PSS), which is a Likert scale questionnaire for measuring the perception of stress in individuals (Cohen, Kamarck & Mermelstein, 1983). Due to the lack of questionnaires focusing on stress related to study forms, a Likert scale survey was created with 20 original questions. All questions in the survey were worded as a positive or negative personal statement and related to the three dimensions of Karasek's JDSC model:

Demand (questions 6, 9 & 8) and Control (2, 3, 4 & 8) examined how stimulating the study forms were and the involvement of the students when taking part (Gatchel et al, 2012, chapter 6). Work pressure related to studying checked if the presence of peers impacted the experience. The motivation the students perceived before and during the study sessions was of interest as well. Lastly, general work satisfaction with the end results and the students' personal contribution to the task was also tested in relation to skill discretion and intellectual discretion (Stressforskningsinstitutet, 2015b).

Social Support (questions 1, 5, 7, 10) from colleagues was inspected (Tausig et al, 2011, chapter 1, Gatchel et al, 2012, chapter 1). This means students being able to make friends and experience feedback from their classmates. Buote et al (2007) emphasizes how friendship bonds in University are important for assimilation and emotional integration.

The participants rated if they agreed with the statement or not on a scale of 0 (*strongly disagree*) to 4 (*strongly agree*). The survey measured distress with questions 4, 5, 7 and 8 being positive and scores reversed. The questionnaire was divided into two parts with good reliability for both Group study (Cronbach's $\alpha = .716$) and Individual study (Cronbach's $\alpha = .765$). The questions were similar without correlating too strongly according to an inter-item correlation matrix, with the exception of words being replaced to suit either study form. The participants also answered demographic questions.

Procedure

45 Swedish University students were scouted online through different student group forums, using a convenience sample, where they were linked to a survey. A paired-sample two-tailed *t-test* was performed to check for differences of mean between the two conditions, $\alpha = .05$.

RESULTS

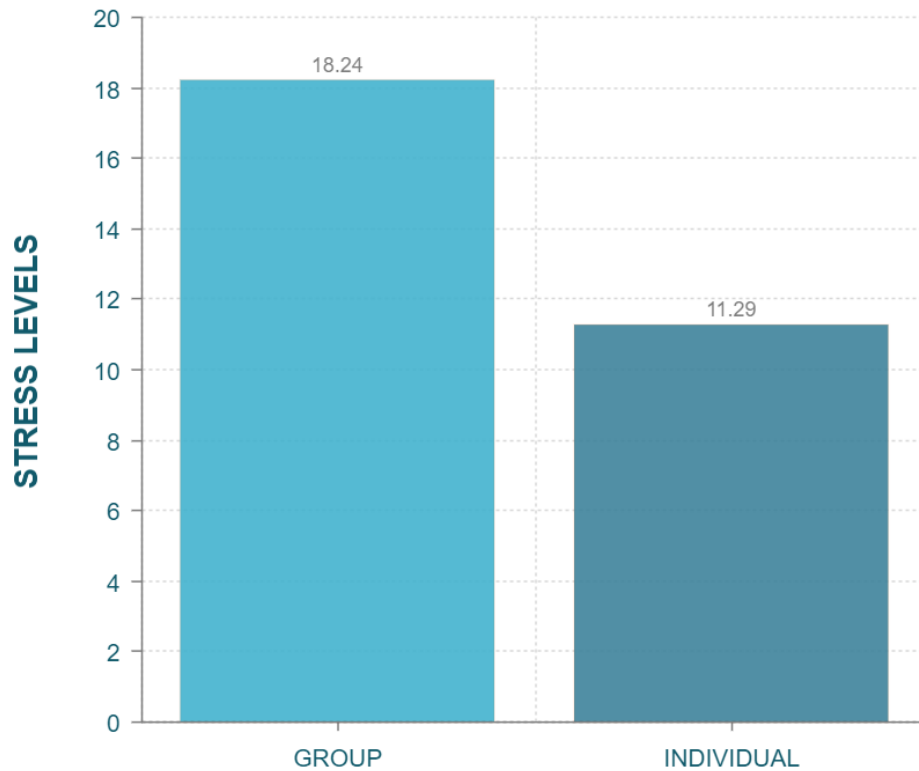


Figure 2. Subjective stress ratings for Estimated Average Means.

A strong statistical significance of the t-test ($\alpha = .05$) was found: $t(44) = 4.73, p < .001$. Group Study displayed higher levels of perceived stress ($M = 18.24, SD = 6.3$) than Individual Study ($M = 11.29, SD = 6.2$). This result suggest that working with peers may raise the distress of students in University.

The null-hypothesis has therefore been rejected, with Group study scoring higher on stress than Individual study.

Table 1.
Study Form Self-rated Percentage Scores of Students.

Survey Questions	Study Form	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Not looking forward.	Group	6,7%	20%	20%	33,3%	20%
	Individual	35,6%	35,6%	11,1%	15,6%	2,2%
Don't feel motivated.	Group	15,6%	33,3%	31,1%	15,6%	4,4%
	Individual	31,1%	24,4%	20%	17,8%	6,7%
Don't feel satisfied with the work input.	Group	13,3%	23,4%	28,9%	22,2%	11,1%
	Individual	37,8%	26,7%	22,2%	11,1%	2,2%
Feel involved in the decision-making.	Group	0%	6,7%	24,4%	42,2%	26,7%
	Individual	0%	2,2%	2,2%	20%	75,6%
Feel good during study session.	Group	6,7%	15,6%	33,3%	26,7%	17,8
	Individual	0%	6,7%	13,3%	33,3%	46,7%
Feel more pressure to do well.	Group	8,9%	17,8%	15,6%	31,1%	26,7%
	Individual	11,1%	22,2%	24,4%	26,7%	15,6%
Don't feel lonely.	Group	13,3%	4,4%	26,7%	28,9%	26,7%
	Individual	11,1%	8,9%	8,9%	26,7%	44,4%
Grades and results are satisfying.	Group	4,4%	17,8%	35,6%	35,6%	6,7%
	Individual	2,2%	4,4%	17,8%	46,7%	28,9%
Less focused on the task.	Group	28,9%	24,4%	26,7%	15,6%	4,4%
	Individual	40%	22,2%	24,4%	11,1%	2,2%
Complaint to friends.	Group	17,8%	11,1%	17,8%	24,4%	28,9%
	Individual	40%	35,6%	11,1%	11,1%	2,2%

Note. Values are frequency percentages on scores 0 = *strongly disagree*, 4 = *strongly agree*.
N = 45.

DISCUSSION

Results from the questionnaire displayed a mean difference between the study forms in accordance with the hypothesis. The factors related to the reported distress can be analyzed and demonstrated with the help of the JDCS model and the answers chosen by the participants (Table 1).

Individual study stood out with higher satisfaction with the final grade (76%), the personal work put into the task (65%) and better task focus (62%). Since the students worked alone they also naturally experienced high levels of decision-making (96%). Motivation was mainly positive during self-study (55%). Most students looked forwards to Individual studying as well (82%). The level of complaint to friends about the study session was very low (2%). Student's generally didn't feel lonely during self-study (71%). These factors are all positive and can be tied to higher levels of eustress.

Group study scored less on grade satisfaction (34%), work contribution (37%) and task focus (53%). Attitude towards the study form was in higher degree negative where most students didn't look forward to the Group study session (53%). Complaints about the Group project to friends were also relatively high (53%). This suggests that cooperation and mutual trust in other participants could be lower than ideal due to the nature of Group study. Such experiences can cause distress as unsatisfactory work process and results impact the attitudes and future expectations of students (Hillyard et al, 2010).

Pressure to do well when studying was higher with peers (58%). Motivation to work in a group proved moderate (49%) and decision-making scored quite well too (69%). So did the ability to make friends (56%), which can be seen as promising signs of eustress. Though it seems unlikely that these eustress effects are enough to influence the other factors as per the buffer hypothesis based on the overall stress score. And past research does imply a link between negative social experiences and distress (Birmingham, Uchino, Smith, Light & Sanbonmatsu, 2009).

Group work is a powerful method which may yield advantages to both the individual and society when it produces creative solutions, more knowledge and new products (Al-Nashash, 2016). Yet the advantages of working and studying together with peers becomes lost when the experience is considered simply stressful. Students voicing negative opinions and expectations about Group study paints a bleak picture of the work method and its perception (Hillyard et al, 2010). Though one can find studies where students do perceive Group work favorably, as long as the other participants are motivated and pull their own weight (Walker, 2001). This shows how important cooperation, motivation and trust is for this study form as it directly influences performance (Heavey, Halliday, Gilbert & Murphy, 2011).

All in all, there seems to be a discrepancy between the theoretical positive benefits of Group study and the perceived reality of this study form. This creates a situation where Group study itself becomes a potential high strain work method (Gatchel et al, 2012, chapter 5) and a generalized stressor (Selye, 1978). Individual study does include characteristics of distress yet to a lower level since there are more eustress aspects. Both

study methods could, therefore, be seen as stressors, with Group study being linked to higher levels of distress.

To theorize exactly why students experience strain during different study forms goes beyond the scope of this paper. However, past research does shed some light on the matter of the way the study sessions are conducted, especially Group study. And so it's worth mentioning for the sake of future research. According to Al-Nashash et al (2016), it's common for participants to divide the work among the members in a Group study instead of working together each step of the way. This means cooperation isn't high and social support may in that case also be low. This ties to research pointing out the importance of learning *how* to work in groups and the impact instructors have to create a functioning learning experience for the students even in University (Bailey, Barber & Ferguson, 2015).

This study used a Student's t-test to compare the levels of perceived stress. It's generally considered a reliable and strong statistical measure. Nevertheless, problems may arise due to order effects (Aron, Aron, & Coups, 2012). One survey contained the two parts tested in the same order and all the participants accessed exactly the same survey. To avoid order effects the parts needed to be switched around, giving the participants different-looking surveys. However, due to the survey being administered online it would've been rather difficult to control that the number of people answering survey version A and survey version B were equal and did not impact the data in any way. For this reason, all 45 participants in this study answered the same survey.

Stress can be influenced by many factors working together (Selye, 1978). And so the stress reported in this survey may be connected to confounding variables such as general stress levels or earlier negative experiences of Group study as noted by Walker (2001). A wider perspective on the subject is required to fully understand the stress experienced by students during study forms. The participants were also largely female which meant that a comparison between women and men was not possible. A look at gender as a factor would be advisable in future studies as there have been reports of a tendency for women to experience higher levels of distress (Baldwin, Towler & Datta, 2017, Campbell et al, 1992).

The examination of a relationship between stress and study forms offers insights into how students can be engaged to study alone and together in a more satisfying manner. Something which may prove positive for the overall mental health of University students.

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APPENDIX

Strongly disagree = 0

Disagree = 1

Neutral = 2

Agree = 3

Strongly agree = 4

Group study

1. When a group project is planned I don't look forward to it.
2. I don't feel motivated when working with other students on projects.
3. I don't feel satisfied with the work I do when working in a team.
4. When working with others I feel involved in the decision-making.
5. When I can work with other people I feel good.
6. During work with a team I feel more pressure to do well.
7. I have made friends through group projects.
8. When working on a group project I feel my grades and results are satisfying.
9. Group projects make me less focused on the task.
10. I find myself complaining about the group project to my friends.

Individual study

1. I don't look forward to studying alone.
2. It's hard for me to keep my motivation when studying independently.
3. I don't feel satisfied with the work I do when studying alone.
4. When working independently I feel I can make my own decisions.
5. When I can study independently I feel good.
6. I feel more pressure to do well when studying on my own.
7. I don't feel lonely when studying alone.
8. When working alone I feel my grades and results are satisfying.
9. Independent studies make me less focused on the task.
10. I find myself complaining about studying alone to my friends.