Ego-Depletion Theory, Autonomy Support, and its Effect on Alcohol Consumption

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Abstract

The purpose of this study is to look at a specific health behavior: alcohol consumption. This behavior will be studied by using the ego-deletion theory and looking at the moderating role of autonomy support, to determine if autonomy support will lead to greater self-control strength and thus the ability to resist drinking alcohol. 40-60 Bates College students, 21 years and older, will be used as participants for this study. Temptation to drink will be measured by the Temptation and Restraint Inventory Measure, and participants will be randomized into an autonomy supportive condition or a no autonomy support condition. They will all complete a depleting task, and then will engage in a taste test. We will measure alcohol consumption by conducting a *t*-test measuring alcohol consumption based on the condition of the participants. We will also run a regression analysis to see the relationship between trait temptation to drink and alcohol consumption. We expect to find that individuals who do not receive autonomy support will consume more alcohol than those who do, but this effect will be stronger for those individuals scoring relatively high on trait temptation to drink alcohol. We will discuss implications of these findings in the discussion.

Keywords: ego-depletion, autonomy-support, vitality, alcohol consumption

Ego-Depletion Theory, Autonomy Support, and its Effect on Alcohol Consumption

People are generally good at exerting self-control for the benefit of long-term goals; however, self-control in not an unlimited source of strength. Self-control is the process of overriding or inhibiting automatic, habitual, or innate behaviors, urges, emotions, or desires that would otherwise interfere with goal directed behavior (Muraven & Shmueli, 2006). Those who are able to exert self- control over a specific behavior or action are more likely to be successful in executing the action or behavior. However, gaps in self-control can result in an inability to follow such behaviors and actions. Numerous personal, social, and health-related problems have their roots in a person's failure to self-regulate. Self-regulatory failure is related to many issues and problems that people encounter such as personal debt, substance abuse, obesity, unplanned pregnancy, sexually transmitted infections, crime and violent behavior (Hagger, Wood, Stiff, & Chatzisarantis, 2010), as well as many health related outcomes such as failure to exercise, failure to adhere to a medication regimen, relapse in smokers attempting to quit, and engaging in risky behaviors such as unprotected sexual intercourse or binge drinking (Hagger, Wood, Stiff, & Chatzisarantis, 2009). All of these issues stem from the failure to self-regulate and can be detrimental to the self and one's health. Therefore, it is important to understand the process of self-control and the process that can lead to its failure.

It has been argued that all acts of self-control are effortful, and one process that leads to the failure of self-regulation is a state called ego-depletion. Ego-depletion is theorized to be "a temporary reduction in the self's capacity or willingness to engage in volitional action (including controlling the environment,

controlling oneself, making choices, and initiating action), caused by prior exercise of volition" (Moller, Deci, & Ryan, 2006, p.1024). The majority of studies supporting ego-depletion have used the strength-energy model to demonstrated that one act of self-control can effect performance on a subsequent, yet unrelated task, that requires self-control (Moller et al., 2006). The ego-depletion effect of the strength-energy model has often been tested in experimental designs using a two-task paradigm. In the procedure of these experiments, participants have been assigned to a depletion group and a no-depletion control group. The participants in the depletion condition have to perform a task that will require self-control. It will be a task that overrides learned responses or requires the resistance of temptations or impulses. Participants in the no-depletion control group engage in a similar task, but one that requires no self-control. After the first task, all participants perform a second task, usually in an entirely different domain as the first one. Performance on the second task is the dependent measure of depletion (Hagger et al., 2009). Typically, the participants in the no-depletion condition perform better than those in the depletion condition.

        An important characteristic of the strength-energy model is that self-control is a global resource. This indicates that all actions and behaviors that require self-control will deplete it and the depletion of self-control will lead to failure in self-regulation (Hagger et al., 2009). In the strength-energy model of self-control, self-regulation is seen as consuming a limited resource that is used when people participate in activates that require self-control (Hagger et al., 2010). Thus, self-control is finite and can become depleted over time. The failure of self-regulation is

the depletion of resource because individuals are no longer able to successfully

resist temptations or urges. The metaphor of a muscle is often used for this

strength-energy model. Just as a muscle becomes week and fatigued over time, and

requires rest to replenish its strength, further self-regulation can only be applied

after self-control resources are reloaded (Hagger et al., 2010).

An example of this effect is shown in the experiment by Baumeister,

Bratslavsky, Muraven, & Tice (1998). Experiment 1 of this study demonstrated the

effects of ego-depletion. Participants in this study were either assigned to a radish

condition, chocolate chip condition, or no food condition. The laboratory was filled

with the aroma of the chocolate chip cookies, and the experimenter asked the

participants to eat 2 or 3 items of the food condition they were assigned to. The

experimenter then left for 5 minutes and watched through a two-way mirror to

ensure that the participants were eating the food they were assigned to. After 5

minutes all participants had to complete a problem-solving task, which was a puzzle.

The participants were told that they could take as much time and as many trials as

they wanted to complete the puzzle, and that they would be judged whether or not

they finished the task or asked to stop before they finished. This experiment found

that participants in the radish condition performed worse on the task and gave up

more easily out of frustration compared to the other two conditions. They were

depleted because they had to resist the temptation of the cookies in front of them

and also had to eat the radishes even if they did not desire to do so. Therefore, here

we see an example of how performance on a subsequent task is the dependent

measure of depletion.

The analogy between self-control and a muscle was suggested by early findings that self-control deteriorates after initial exertions. However, just as exercise can make muscles stronger, regular exertions of self-control can improve willpower strength. These willpower strengths take the form of resistance to depletion, which means that self-control resources are depleted at a slower rate (Baumeister, Vohs, & Tice, 2007). Daily efforts exerting self-control to improve posture gradually produces improvements in self-control. Also, similar to how athletes conserve their remaining strength and energy when their muscles begin to tire, individuals also tend to preserve their self-control resources when some of these resources have been expended (Baumeister et al., 2007). Thirdly, individuals can also continue to exert self-control despite ego-depletion effects if the stakes are high enough. For example, offering money incentives for good performance can counteract the effects of ego-depletion (Baumeister et al., 2007). All these characteristics of ego-depletion are important to understand because given how important the capacity for self-control is, it would be problematic for an individual to lose that capacity completely (Baumeister et al., 2007).

Autonomous Regulation and Controlled Regulation

Self-control is fundamental to regulate actions. It is important to understand the two different forms of regulation: autonomous regulation and controlled regulation. Self-determination theory (SDT) draws an important distinction between autonomous regulation and controlled regulation (Moller et al., 2006). Autonomous regulation refers to regulation that is initiated and sustained by one's integrated, or true, self, whereas controlled regulation encompasses regulation by

aspects of the person that are less well integrated with the self (Moller et al., 2006).

Controlled regulation involves feeling pressured, forced, or seduced into action,

whereas autonomous regulation involves doing what one finds interesting or

important and could be inclined to do so more freely (Moller et al., 2006).

Essentially, SDT proposes two different types of motivation: intrinsic, which refers

to doing something due to interest or enjoyment, and extrinsic, which refers to

doing something for instrumental reasons (Muraven, Gagné, & Rosman, 2008).

Situations that are autonomy supportive encourage a more intrinsic motivation.

Research has found that situations where the person's feelings are acknowledged

and where the person feels like they are free to choose a course of action that aligns

with his or her goals and personal desires, are more conductive to the person's

commitment to the course of action (Muraven et al., 2008). Therefore, this

autonomous motivation is important to ensure that people follow a course of action,

such as maintaining proper health behaviors.

Muraven, Gagné, & Rosman (2008) conducted an experiment where they

believed that a self-control task would be more or less depleting depending on the

person's feeling of autonomy. He noted that when a person resists the temptation to

eat sweets while dieting because it is valuable to him or her, then less self-control

strength is required compared to when a person does not eat a cookie because they

were told not to. Autonomous feelings of self-control may involve less feelings of

internal conflict and may be more energizing than forced self-control. This reduced

conflict and increased energy may increase a person's self-control strength and thus

improve their performance in resisting temptation. Muraven and colleagues' (2008)

study examined the relationship between self-control strength and the feelings of autonomy. The participants were asked to resist eating cookies, which is something that requires great self-control strength to resist the impulse and natural desire to eat them. In this study, participants who felt obligated by external reasons not to eat the cookie were more depleted and preformed more poorly on the final measure of self-control performance compared to the participants who resisted eating the cookies for more internal reasons.

Vitality is also an important factor of self-regulation, because autonomy can boost energized behavior. Vitality can help explain why autonomy support is less depleting while exerting self-control. Vitality is defined as "a subjective feeling of aliveness and energy" that originates from feelings of autonomy support and intrinsic motivation (Muraven et al., 2008, p. 574). It is an energetic, vital state that increases when people feel autonomous and it decreases when people feel pressured (Muraven et al., 2008). Usually after exerting self-control one feels depleted, but feeling vital may replenish strength at a quicker rate. Individuals tend to recover their strength quicker when they feel vital, thus resulting in better performance. This indicates that the energizing experience of regulating a behavior for autonomous reasons leads to a faster recovery of strength, which leads to greater performance on self-control tasks (Muraven et al., 2008).

Researchers have identified gaps in self-regulation as an important psychological mediator of numerous health-related behaviors (Hagger et al., 2010). One study conducted by Magaraggia, Dimmock, & Jackson (2013) studied eating, specifically snacking. The aim of this study was to determine whether

undergraduates exposed to autonomous learning conditions would snack less on jellybeans, a glucose-rich food compared to the controlled choice learning condition. The other aim of this study was to determine if the autonomous choice condition would perform better on a self-control task than the controlled choice participants, after controlling for glucose consumption. Magaraggia, Dimmock, & Jackson (2013) found that participants in the autonomous learning condition did consume fewer jellybeans compared to the controlled choice participants. Also, when controlling for food consumption, participants in the autonomous choice group performed better than the controlled choice group. The most important finding of this study was that participants in the controlled choice group snacked more than those in the autonomous choice group, thus illustrating how autonomy is beneficial and does make a difference. This demonstrates that snacking is an impulsive behavior and this study supports the possibility that motivations directing one activity might influence the performance of others.

Drinking Behavior

Another health behavior, which has been studied in the realm of ego-depletion, includes drinking behavior. Studying factors that influence drinking behavior is extremely important, particularly in the college population. Heavy episodic binge drinking among college students is a major public health concern. Binge drinking is a leading cause of preventable death on college campuses. Studies have identified that binge drinking is rampant in college settings, and some studies indicate approximately 50% of students report binge drinking. One recent study noted that about 500,000 college students are injured and 1,700 die each year from

alcohol-related injuries. Binge drinkers have a greater risk for developing alcohol dependencies as well as being associated with unprotected sex, violent acts, automobile crashes, and overall poor neuropsychological functioning Fillmore & Jude, 2010).

Aside from how prevalent drinking is, and its various consequences, it is widely accepted that heavy alcohol consumption is associated with various health problems, but that it remains important to distinguish the types of health harms and specific health effects of drinking (Lown, Greenfield, & Rogers, 2007). Lown, Greenfield, & Rogers (2007) conducted an analysis, which aimed to clarify the specific content underlying self-reported health harms and to report the lifetime prevalence of specific health-related harms identified in a methodological study. The study was conducted by a phone interview that lasted approximately 20 minutes. Series of questions were asked about alcohol consumption, and health harm questions. The health harm questions were categorized into how drinking could have harmful effects on (a) friendships and social life, (b) your health, (c) home life and marriage, (d) financial position, (e) work and employment opportunities, (f) cognitive impairments, (g) behavior problems, (h) sleep problems, (j) high blood pressure, and (k) unclassified "other" problems. Descriptive data was collected depicting the range and prevalence of various specific health problems as a result of drinking alcohol. The problems ranged from acute problems simply from overdrinking (such as vomiting, nausea, headaches) to serious medical conditions (such as mental health problems, internal organ effects, and sleep problems).

Therefore, there is data suggesting the numerous ways and various domains of one's health and life can be affected by alcohol consumption.

Understanding when individuals tend to consume more alcohol and why is an important factor. A 30-day college student diary study conducted by DeHart, Peterson, Richardson, and Hamilton (2014) examined daily perceptions of mistreatment, ego-depletion, and alcohol consumption. One way in which individuals tend to respond to stressful events and mistreatment is by drinking. This tendency is prevalent in college students, and it comes with many negative consequences. This study aimed to investigate whether individuals drink more during the evenings on the days in which they perceive more mistreatment versus less. It also investigated ego-depletion as a moderator between the relationship of mistreatment and maladaptive alcohol consumption. They found that college students who reported being ego-depleted drank more on the evenings that they perceived more negative mistreatment. The more negative their mistreatments were, while being ego-depleted, the more likely they were to binge drink. In contrast, they also found that on the days that college students reported they were not ego-depleted, perceptions of mistreatment was unrelated to the increases in alcohol consumption. This is important because these findings suggest that perceived mistreatment only leads to increases in alcohol consumption when the participants did not have the resources to self-regulate and cope with this threat to the self (mistreatment).

There are many responsibilities and difficult choices that individuals who drink have to consider. Particularly, social drinkers face the dilemma of can they

enjoy themselves and drink without consuming too much? The ability to restrain

one's drinking is critical to sticking to self-imposed drinking limits in situations

which encourage drinking (Muraven, Collins, & Neinhaus, 2002). Drinking restraint

is defined as "the preoccupation with control over alcohol intake" (Muraven et al.,

2002). When the impulse to drink is greater than the individual's ability to suppress

that impulse, the individual is more likely to drink more. There is evidence that

supports this response-conflict view of drinking restraint. For example, heavy

drinkers report stronger impulses to drink compared to moderate drinkers

(Muraven et al., 2002). Collins and Lapp (1992) found that social drinkers who self-

reported (using the Temptation and Restrain Inventory, which measures drinking

restraint) being high in preoccupation with alcohol and low in trait control over

alcohol consumption consumed more alcohol than those who were high in

preoccupation and also high in trait control over alcohol.

Self-control is critical to the success of regulating alcohol intake. When an

individual's ability to regulate alcohol intake is depleted or weakened, they are

likely to drink more. Drinking restraint theory suggests that the amount consumed

is a function of the trait temptation to drink and the ability to override that

temptation (Muraven et al., 2002). This is important because individual's trait

temptation to drink may inhibit their ability to exert self-control to determine how

much alcohol is consumed. Once their self-control strength is depleted, individuals

who are high in trait temptation to drink should consume more alcohol than

individuals who are low in trait temptation (Muraven et al., 2002). Therefore, there

is an interaction between trait temptation and depletion that is important to
consider.

Present Research

This present study is designed to build off of previous Muraven studies done
on ego-depletion and the moderating role of autonomy. Autonomy support and
vitality are found to be less depleting, thus improving self-control performance. This
study is measuring the alcohol consumption of individuals in an autonomy support
condition compared to those not in an autonomy support condition. We hypothesize
that students in the autonomy support condition will feel less depleted and feel
greater intrinsic motivation than the no support group. We also predict that
students in the autonomy support condition will be able to resist drinking or drink
less versus students not in the autonomy-support condition, who will experience
more ego-depletion and will drink more. Finally, we predict that there will be an
interaction with trait temptation to drink and the amount of alcohol consumed. This
will reveal that individuals who have high trait temptation will be more affected by
the manipulation of autonomy support compared to individuals with low trait
temptation. That is, the difference in amount of alcohol consumed between the
autonomy support and no autonomy conditions will be greater for those higher in
trait temptation to drink than for those scoring lower in trait temptation.

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Method

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Participants

The participants in this study, approximately 40-60 individuals, will be
undergraduate students from Bates College, both equal numbers of males and

females. Due to the fact that this experiment will be conducted under the pretense of

alcohol, participants will all be at least 21 years old. The participants in this study

will be incentivized by being given course credit, for psychology 101. The other

participants not in psych 101 will be entered into a raffle to win a $20 gift card from

the Den.

Procedure

Preliminary phase:

Participants will be told that the purpose of the study is to measure taste

preference of beer and how that correlates to cognitive performance on

concentration tasks. Consent will be obtained from the participant, and the

experimenter will check their photo ID to verify that the participant is 21 and

eligible to participate in the study. All students will complete a short demographics

questionnaire asking for their grade, gender, etc. They will also be given the

Temptation and Restraint Inventory (TRI) questionnaire, which measures drinking

restraints and temptation. This is a 15-item measure and each item (e.g., "is it hard

to distract yourself from thinking about drinking") is rated on a 9-point Likert scale,

with 1= *never* and 9=*always*. After finishing both the TRI and demographics

questionnaires, the students will be randomized in either one of two conditions:

autonomy supported condition or no autonomy-support condition.

Depletion phase:

All students, regardless of which condition they are assigned to, will

complete an exercise called the "e" task in which they are given a page of text and

they have to search for and cross out the letter "e". This exercise is expected to

require self-control, and will therefore be depleting because the crossing out of the

letter "e" follows a complicated rule that will require focus and concentration. All

the participants will be assigned to the depletion condition. Similar to the Muraven

et al. (2008) experiment, during this phase the students in the autonomy support

condition will receive kind and encouraging treatment from the experimenter. For

example, when the experimenter provides the participant with the questionnaires

they will say, "if you don't mind would you spend a few minutes filling out these

questionnaires, please?" The experimenter will be nice and polite to the participant

and will go out of their way to explain the experiment to the participants and

alleviate any concerns or answer any questions. However, in the no autonomy-

support condition the experimenter will act in an opposite manner, they will be cold

and put pressure on them. The experimenter will instead order the participants to

take part in the task and express little interest in their concerns. After the

manipulation is completed, the participants will receive two manipulation checks.

They will be given the Intrinsic Motivation Inventory (IMI) questionnaire, which

contains several items measuring intrinsic motivation (e.g., "I would describe this

task as very interesting", answered on the scale 1 = *not at all true* to 7 = *very true*) in

order to ensure that the experiment is successful in creating a context that led to

autonomous motivation. Other than the IMI, there will also be another manipulation

check adapted from Boucher & Kofos (2012). This questionnaire contains 5 items

(e.g., "the task was difficult") measured on a 5-point Likert scale, with 1= *strongly*

disagree and 5= *strongly agree*. This manipulation check is designed to determine if

the task given actually caused depletion by asking if the participants to fight an urge

while working on the task, if the task was frustrating, if the task was difficult, if they felt motivated to do well on the task, and if they had to exert effort on the task.

Drinking phase:

After the depletion task all participants will participate in the second task, which is the drinking task. This task will be performed under the assumption that it is a taste test. However, prior to the taste-test participants will be told that they will have to perform a second task that requires concentration and skill. This won't actually happen, but it will be said to give participants a reason to limit their alcohol intake, because the alcohol would impair their performance. Similar to Muraven, 2002 experiment, the participants will be given two pitchers of beer. The beer in this experiment will be non-alcoholic; however, the participants will not be told that. The pitchers will be labeled A and B. The participants will also be supplied with glasses. The participants will be given sheets asking them to rate the beers on several dimensions, such as their liking of it. This questions will be rated on a 5-point Likert scale, 1= *strong disliking* and 5= *strong liking*. The sheet will also ask that the participants to come up with and write down at least 5 descriptive characteristics of each beer. The participants will be told to they are free to taste as much or little as they want.

Finally, the experimenter will thank and debrief the participant. Once the participant leaves, alcohol consumption will be determined by the weight of the pitcher and glasses (in ounces).

Results

Manipulation Checks. In this section, we will compare the means and standard deviations derived from the questionnaire adapted from Boucher & Kofos (2012) for the no autonomy support participants and the autonomy support participants, using independent samples t-tests (after verifying with Cronbach's alpha that the items are internally consistent). We believe the participants in the no autonomy support condition will indicate that the "e" task was more frustrating, difficult, and that they had to exert effort and fight an urge compared to the participants in the autonomy support condition. This is also where we will provide the analysis for the IMI manipulation check to ensure that our experiment was successful in creating contexts that led to actual autonomous motivation, again using an independent samples t-test (again after checking the reliability of the items). If the manipulation is successful, the results should indicate that participants in the autonomy support condition experienced more autonomy compared to the no autonomy support participants.

Main Analysis - Alcohol Related Outcomes. We will run a regression using the information of trait temptation to drink (treated as a continuous variable) and the condition of the participants (dummy-coded: 0 = *no autonomy support,* 1 = *autonomy support*) as predictors. The dependent variable will be the amount of alcohol consumed, measured in ounces. We expect to find that individuals with higher trait temptation will consume larger amounts of alcohol than those with lower trait temptation, and individuals in the no autonomy support condition will consume more alcohol than those in the autonomy support condition. We also expect to find a significant interaction, which we will unpack using tests of simple

slopes (plotted with trait temptation to drink at +1/-1 standard deviations from the mean; Aiken & West, 1991). We expect this will reveal that the simple slopes for those scoring high and low on trait temptation will be significant (in line with the overall effect for condition); however, those will higher trait temptation will consume more than those scoring low in the no autonomy support condition.

Discussion

In this section, we will summarize what we found in our results and if the results supported our hypothesis. This section will also discuss possible limitations of our study. It will also include generalizability, because our participants are from a very particular pool of people. Therefore, because all the students are 21-22 years old and from Bates College, it might not be generalizable to others or to other places because the drinking culture at Bates, and college is different than outside of college. This section will also have a paragraph about future research. This will include what needs to be done for the future, and which ways our study can be improved. Finally, this section will also include possible implications. If we find what we are expecting to find, the implications of this research, in terms of future health interventions or information, can contribute greatly to the better understanding of drinking behaviors.

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