2017

Creativity as a Route to Attitude Change: Can the Creative Process Augment the Effectiveness of a Persuasive Message?

Agnes Rieger
arieger@wellesley.edu

Follow this and additional works at: https://repository.wellesley.edu/thesiscollection

Creativity as a Route to Attitude Change:

Can the Creative Process Augment the Effectiveness of a Persuasive Message?

Aggie Rieger

Wellesley College

Submitted in Partial Fulfillment
of the
Prerequisite for Honors
in the Department of Psychology

April, 2017

Acknowledgements

Abstract

This study investigated the possibility that engagement in the creative process can augment the effectiveness of a persuasive message. Non-academic Internet use was used as the attitude change stimulus. The persuasive message was delivered via video, and the creative activity involved making a collage online. The creativity of the collages was later judged by a panel of experts following the Consensual Assessment Technique (CAT). To the researcher's knowledge, no previous studies have attempted to investigate the creative and attitude change processes in combination. However, these two processes have important similarities in that both attitude change and creative outcomes are very much dependent on motivation, ability and effort, and both processes involve the formation of new connections and mechanisms of evaluation. Study results indicated that engagement in a creative process can, in fact, augment the effectiveness of a persuasive message. The argument is made that the mechanism behind this facilitative process is largely affective. An unexpected consequence of this study was the discovery that the vast majority of participants exhibited unusually problematic levels of Internet use. These findings are also discussed.

Key words: creativity, creative process, persuasion, Elaboration Likelihood Model

Creativity as a Route to Attitude Change:

Can the Creative Process Augment the Effectiveness of a Persuasive Message?

The study of creativity is a large and ever-growing area of psychological inquiry. Attitude change, too, is a major area of focus for psychology researchers. To date, no studies to our knowledge have combined these two influential areas of investigation, despite the fact that the questions being asked and the theories being proposed in the two research literatures are similar in a variety of important ways. Empirical investigations and explanatory models in the two areas complement each other nicely and call for a synthesis that could prove fruitful on both a theoretical and a practical, applied level. Important connections between the two literatures include a focus on: process context, the roles played by motivation, ability, and effort, the formation of new connections, and mechanisms of evaluation.

Understanding Creativity

The empirical investigation of creativity is important because creativity is what leads to human advancement. It is imperative that society discover creative solutions to pressing concerns, especially in an increasingly connected world (Amabile, 1982; Hennessey & Amabile, 2010). Yet, the facilitation of creative thinking, the pinpointing of exactly what creativity entails and how it can best be promoted, has proven to be extremely challenging. Within the field of creativity research, even the definition of the phenomenon itself presents difficulties and is often inconsistent (Hennessey & Amabile, 2010).

Creativity can be defined and evaluated as a process or action that someone performs; as a final product, object or idea that is produced; or simultaneously as both a process and a product. Most investigators agree that for a product to be deemed creative, it must be both novel and appropriate (Hennessey & Amabile, 2010; Rogers, 1954). Creativity is often also researched

in terms of creative persons themselves, for example, in case studies of artists or other successful

professionals (e.g., Wallace & Gruber, 1989). The range of perspectives and research

methodologies being employed to unravel the mysteries of the creative person, product and

process reflect the status of the study of creativity as a wide reaching and, at times, fragmented

field (Hennessey & Amabile, 2010).

Over time, researchers have come to understand that creativity results from a highly

complicated and intricate interplay of a number of factors (Hennessey & Amabile, 2010). The

complexity of creativity, including its often subjective nature, complicates research into this

phenomenon. Equally complex are the many different research approaches taken by

investigators, from case studies and self-assessments to surveys and attempts at scored

evaluation of creative products (Kaufman, Lee, Baer, & Lee, 2007). Yet, despite the ephemeral

nature of this phenomenon and the wide range of methodologies used to investigate it, the data

do show that people are able to agree about the creativity of products. When guided by their

own, subjective definition of creativity, people generally reach a consensus as to the relative

creativity of products, be they children's collages, haikus written by adults or the computer

programming of CS college students. This ability to come to consensus, especially among

experts in a field, is the crux of the Consensual Assessment Technique (CAT), which has come

to be seen as a valid and convenient solution to the problem of how best to measure this

perplexing phenomenon (Amabile, 1982; Hennessey & Amabile, 2010). The CAT requires a

panel of experts, broadly defined, to make independent product assessments. These expert raters

do not confer with each other or receive training from researchers. Instead, the judges examine

the given products and, guided by their own, subjective definition of creativity, rate them on

creativity as well as a variety of other dimensions including technical goodness and general

liking. The only instruction judges are given is that at least one product needs to receive the highest possible score for creativity, and at least one must receive the lowest possible score (Hennessey, Amabile, & Mueller, 2011).

As mentioned above, creativity can be evaluated on many different levels. Stein (1953) and others (e.g., Kaufman & Beghetto, 2009) have proposed that focusing on the creativity of the genius, rather than more garden-variety displays of creativity, leads researchers to overlook important nuances in creative personalities and processes. At issue here is the conceptualization that there are multiple levels of creativity. According to this argument, creativity must be operationalized in terms of a continuum, with what has come to be termed "Big-C" creativity at one end and "little-c" creativity at the other. In fact, this Big-C/little-c creativity dichotomy is now a popular perspective taken in contemporary creativity research (Kaufman & Beghetto, 2009). Big-C creativity reflects the idea that true creativity is produced by geniuses, and focuses on individual, inherent greatness in the mind of a creator (Merrotsy, 2013; Simington, 1997). Hallmarks that characterize Big-C creativity can include the receipt of well-respected awards and inclusion in an encyclopedia (Kaufman & Beghetto, 2009).

On the other end of the spectrum, little-c creativity captures a more contextual and everyday display of creativity (Stein, 1953). While Big-C creativity focuses on select geniuses, little-c creativity emphasizes the creative potential in all people (Kaufman & Beghetto, 2009). For example, investigations of Big-C creativity might focus on a creator like Leonardo Da Vinci and the ways in which his work propelled cultural transformations. A study of little-c creativity, on the other hand, could describe a single parent managing to maneuver a mess of schedules on a hectic day, or a novice crafter gluing together a birthday card. In a discussion of the differences between these two extremes of creativity, Merrotsy (2013) wrote, "little-c creativity refers to …

a kind of creativity that is far more ambiguous, and far less remarkable, perhaps, than Big-C

Creativity" (p.474).

Stein (1953) was perhaps the first to distinguish between levels of creativity. Kaufman

and Beghetto (2007; 2009) then extended the multi-level framework to include pro-c and mini-c

levels of creativity (Kaufman & Beghetto, 2009). Investigations of the mini-c level of creativity

best allow for the exploration of the developmental stages of creativity; for example, this focus

might include the examination of eminent artists' first childhood creations. The pro-c level of

creativity incorporates the study of creators/creations that are far more influential and that have

received far more recognition in their field or from society in general than have persons or

products in the little-c category; but these pro-c persons and products are not quite at the Big-C

level (Kaufman & Beghetto, 2009).

In a 2013 study, Kaufman and Beghetto surveyed undergraduate students to determine if

they, too, perceived creativity to be at different levels. Specifically, these researchers

investigated whether or not "laypeople" tended to naturally evaluate creativity in terms of the

Four C Model of Big C, Pro-c, mini-c, and little-c creativity. Participants rated descriptions and

examples of what creativity might mean on a 5-point Likert scale, with anchors ranging from *not*

at all creative to *extremely creative*. The researchers found that laypeople did, in fact, view

creativity as being on different levels rather than as a bivariate (either-or) construct.

Interestingly, these study participants tended to combine the levels of Pro-c and little-c creativity,

but viewed the other levels as distinct (Kaufman & Beghetto, 2013). Just as research on the

Consensual Assessment Technique has shown that "laypeople" can and do conceptualize

creativity in the same way as do researchers (e.g., Amabile, 1982), it is interesting to note that

creativity theories that have been formulated by scholars were implicitly understood by this

study's participants (Kaufman & Beghetto, 2013).

Understanding Attitude Change

  Like creativity, the definition of attitude and the measurement/operationalization of this

construct differs across studies. Often, an attitude is thought of as an overall evaluation of and set

of feelings toward an attitude object (Bohner & Dickel, 2011). Attitudes involve a cognitive

component, which is formed based on information and thought; an affective component

involving mood and emotions; and a behavioral component that represents the direct actions

related to an attitude object (Watson, Loizzo, Watson, Mueller, Lim, & Ertmer, 2016).

  Turel (2015) argued that attitudes are highly subject to change because attitude formation

involves processing information, and the information that a person has on a given object of

thought can be different over time and in different situations. Importantly, attitude change

research is influential in large part because attitudes are often cited as the underlying cause

behind behaviors (Turel, Mouttapab, & Donatoc, 2015). As such, persuasion can be a powerful

tool used to change human behavior. Petty and Briñol (2008) defined persuasion as "any

procedure with the potential to change someone's mind" (p. 137). The process of attitude

change, particularly efforts at persuasion, is complicated and has been heavily researched

(Bhattacherjee & Sanford, 2006; Petty & Briñol, 2008).

  Contemporary research in this area largely considers attitude change to be a multi-process

phenomenon. Early investigations of attitude change by persuasion focused on main effects of

particular variables such as features of the speaker delivering a persuasive message (Petty &

Briñol, 2008). Such main-effect research sought to identify single factors that resulted, or did not

result, in significant changes of opinion or perspective, with the belief that the incorporation of

that one factor or the failure to incorporate that factor as part of the persuasive message would have the power to directly influence an audience's attitude at any time (Petty & Briñol, 2008). For example, Petty and Briñol (2008) summarized a 1953 model known as the Yale approach as proposing that anything that disrupted an audience's learning would be deleterious to attitude change, and that any credible source of information would be advantageous and promote attitude change. While such main-effect approaches seem straightforward on the surface, the psychology literature in this area is full of examples of research studies contradicting each other as to which specific factors can be expected to promote attitude change, and which factors fail to result in attitude change (Petty & Briñol, 2008).

The development of more nuanced and layered approaches to attitude change is an important part of social psychology history and helps to explain current models driving research in this area. In response to the contradictions and difficulties of main-effect approaches, persuasion research has now moved beyond studies designed to uncover main effects toward a focus on potential dual processes. For example, Petty and Briñol (2008) described Kelman's research that began to differentiate between types of persuasion. Kelman identified attitude change brought about as the result of agreeing with a thoughtful argument, a process termed internalization. According to this formulation, the process of internalization is viewed in contrast to attitude change that happens purely as the result of an audience's liking for the persuasion source, a phenomenon termed identification. Of these two types of persuasion mechanisms, Kelman argued that internalization leads to longer-lasting and more powerful attitude change (Petty & Briñol, 2008). With such theoretical developments, the importance of understanding exactly how it happens that someone changes their mind began to receive research recognition.

The Elaboration Likelihood Model (ELM) is one cutting-edge theory of persuasion and attitude change (Chandler & Munday, 2016). This model is based on a dual-process theory (Bhattacherjee & Sanford, 2006) that proposes two distinct routes to attitude change (Chandler & Munday, 2016). The Elaboration Likelihood Model argues that it is external information that drives most attitude change and the behavioral effects of that change (Bhattacherjee & Sanford, 2006). However, the presentation of logical information or a structured argument is not always the detail that audiences pay the most attention to. According to the Elaboration Likelihood Model, people can form or change an attitude through either a central route or a peripheral route to persuasion (Bohner & Dickel, 2011; Chandler & Munday, 2016; Petty & Cacioppo, 1984). As described above, the central route relies on the presentation and internalization of an argument (Chandler & Munday, 2016) and tends to be the strongest, most purposeful, way to change someone's mind (see the Temporal Persistence Hypothesis proposed by Bhattacherjee & Sanford, 2006). The central route requires motivation, ability, and effort on the part of an audience (Bohner & Dickel, 2011). Audiences think critically about the information being presented, evaluate its strengths and weaknesses, and make an informed and deliberate evaluation of the argument being presented (Bhattacherjee & Sanford, 2006). The peripheral route to attitude change, on the other hand, relies on cues separate from the argument itself, such as less logical aspects of an argument and its presentation, including the simple calculation of the number of how many points a speaker has made (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1984).

The question of which of these two main routes to persuasion is taken depends in large part on whether or not the person receiving a persuasive argument is likely to engage in cognitive effort, because the central route to persuasion requires much more cognitive effort than does the

peripheral route (Chandler & Munday, 2016). Naturally, if a person is unable, unwilling, or unmotivated to think critically and combine information related to the persuasive message, that individual will not take the central route to persuasion. Within the Elaboration Likelihood Model, the Elaboration Likelihood Construct has been proposed by researchers to capture the required ability and motivation needed to take the central route to persuasion (Petty & Cacioppo, 1984). Audiences who are most likely to engage in cognitive effort during persuasion are considered to be in what has been termed a "high elaboration state," and are more critical of information given as part of an argument and more likely to consider other ideas of their own (Petty & Cacioppo, 1984).

Areas of Intersection and the Importance of that Intersection Process

Even a cursory examination of the basic concepts driving the study of creativity and attitude change reveals important similarities and points of intersection between the two fields. The following sections expand on several areas of intriguing commonality, from the processes underlying creative behavior and attitude change to explanations as to what makes these processes possible.

Flow

Flow theory is a model that provides helpful insight and a viable starting point for making the connection between creativity and attitude change. Following the work of Jackson and Marsh (1996), flow has most often been framed in terms of the individual's phenomenological experience (Quinn, 2005). Flow is most often seen as a positive psychological state in which a person's engagement with an activity is characterized by the following elements: "challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of

time, and an autotelic experience" (Beard, 2015). The study of flow is often incorporated into creativity research, as flow states are associated with positive affect, deep concentration and improved performance. In fact, flow experiences frequently result in creative breakthroughs. However, it is important to note that creativity does not necessarily require flow and flow experiences do not always result in creative output (Csikszentmihalyi, 1996). Csikszentmihalyi's research (e.g., Beard, 2015; Csikszentmihalyi, 1975) on this phenomenon provides modern insight into the creative process. However, flow can be difficult to describe and measure (Quinn, 2005).

The reference to challenge-skill balance that appears in the flow literature refers to a state in which an activity offers just the right amount of challenge. At the appropriate level of challenge, an individual is required to expend considerable effort and dig deep into their knowledge and skill base, but senses that, in the end, they do have what it takes to meet the requirements of the task. Action-awareness merging is seen as the result of deep focus, and allows the activity to feel spontaneous (Beard, 2015). Unambiguous feedback refers to the cues that a person can notice and understand from the activity as they perform it (Quinn, 2005). Loss of self-consciousness and transformation of time are two of the more subjective elements of the experience of flow. Loss of self-consciousness refers to the experience of being completely focused on an activity; and, similarly, transformation of time refers to the experience of losing track of time while performing that activity (Beard, 2015). The term "autotelic experience" means that the activity is seen as purposeful in itself, rather than having a purpose only in the sense that task engagement will lead to the receipt of an external reward (Baumann, 2012). In this regard, this concept of autotelic experience is similar to intrinsic motivation, a construct which will be discussed later.

Engagement and awareness are also important to flow, and to creativity. Quinn's (2005) conception of flow also includes another element: the combination of awareness of the situation and application of information relevant to the activity (Beard, 2015; Quinn, 2005). As Csikszentmihalyi explained in a 2015 interview (Beard, 2015), when someone is experiencing flow, they are completely immersed in the activity. The experience of flow is similar to, but not the same as, task engagement. In fact, Csikszentmihalyi described the relationship between engagement and flow in terms of flow being "the best manifestation" of the "broader concept" that is engagement (Beard, 2015, p. 357).

Csikszentmihalyi's research on flow began with observations of working visual artists who frequently preferred the process of painting over the end result of appreciating a finished painting. In this work, Csikszentmihalyi also considered artists such as musicians and hobbyists such as chess players who participated in tasks in which the emphasis was on the process of playing itself, rather than an identified end goal or product. Csikszentmihalyi's focus on process is important, especially given its historical context; Csikszentmihalyi was researching flow at the end of a time period when Behaviorism ruled much of the empirical research being carried out on the psychology of behavior. A new perspective, like Csikszentmihalyi's, which focused on action for the sake of action, rather than rewards that come from the completion of a task, was a crucial step in taking creativity research to the point it is today (Beard, 2015).

In a 2005 study, Quinn tested his model of flow. Quinn's study and accompanying conceptualization of flow are helpful for relating the creative experience to knowledge work and for highlighting the importance of both making connections and carrying out evaluations during the creative process. The term "knowledge work" is most often seen in the literature as being applied to the business world, most especially creativity and innovation in firms, and is

conceptualized as being different than the work involved in so-called blue-collar tasks (Quinn, 2005). Briefly stated, knowledge work requires far more abstract use of information than does manual or "rote" activity. Quinn explains that knowledge work is complicated, situation-specific, and does not have one correct way of being done (Quinn, 2005). As a point of interest, Quinn's description of knowledge work shows many similarities to academic work, and to the work done by an individual asked to consider new information presented in an effort to change their mind.

Quinn surveyed 145 knowledge workers at a national laboratory. He analyzed their experiences of flow using the experience sampling method (ESM), randomly signaling participants throughout the day and prompting them to complete a survey after finishing whatever activity they were working on each time they were contacted. Participants were polled 4 times a day for 1 week. Quinn's analysis supported his proposed model of flow, where flow is conceptualized as a phenomenon that is best described as "the merging of awareness and application, with goal clarity, a balance of challenge and skills, concentration, and feedback clarity as antecedents, and with the autotelic experience, sense of control, and loss of self-consciousness as outcomes of flow" (Quinn, 2005, p. 627). Quinn also found that participants were most likely to experience flow when there was a physical element to an activity, and that rates of experiencing flow differed by job type. Importantly, the degree to which flow states were entered into depended, in part, on the complexity of what it was that study participants were doing, with tasks that were simple but required a lot of attention and tasks that were highly technical eliciting the most flow. Interestingly, tasks in the middle of the complexity spectrum resulted in the least amount of flow.

Quinn's study also illuminates some of the difficulties in measuring flow and, in turn, the creative process in knowledge work and beyond. In fact, he described sampling methods as

intrusive, inconvenient, and leading to small participation sizes. Quinn further expands on

motivation's role in flow by proposing that flow can help direct motivation toward a specific,

clear goal (Quinn, 2005). While Quinn's focus on an end goal is at odds with Csikszentmihalyi's

conception of flow as being centered on the experience of performing a task itself, Quinn's

emphasis on motivation is helpful to assembling the bigger picture of motivation's role in the

creative process.

Motivation

Stated simply, motivational orientation plays a crucial role in both the creative process

and in attitude change. More specifically, intrinsic motivation is essential to both of these

processes.

In the case of open-ended tasks with more than one path to solution (some better than

others), an intrinsically motivated orientation has been found to be essential to creative

performance. In fact, hundreds of empirical investigations have shown that intrinsic motivation

predicts creativity (Zhang and Bartol, 2010). Stated succinctly, the Intrinsic Motivation Principle

of Creativity explains that people are more creative when they are motivated to perform an

activity because of their interest in or enjoyment of the task itself, rather than a focus on some

external goal (Amabile, 1996; Hennessey, Moran, Altringer, & Amabile, 2014). Expanding

further, motivation has been shown to influence task engagement (Wolters, Denton, York, &

Francis, 2014) which is important for both flow and attitude change, as will be discussed shortly.

In fact, Zhang and Bartol (2010) argue that creators need to be deeply engaged in a task in order

to have a successful creative process.

Csikszantmihalyi's work on flow also carries with it an emphasis on intrinsic motivation

(Beard, 2015), which is operationalized as the desire to do something in the absence of a clear

outside force fueling an action (Hennessey et al., 2014). Instead of being coerced to engage in an activity, the intrinsically motivated individual participates for the pure excitement, enjoyment and challenge of the task itself (Hennessey et al., 2014). The phenomenon of flow is perhaps the most well-researched and most heavily documented manifestation of this kind of deep engagement (Beard, 2015; Csikszentmihalyi, 1975; Quinn, 2005); and research on flow does much to illuminate the importance of intrinsic motivation to the creative process, in addition to suggesting new and potentially exciting connections to the process of attitude evaluation / attitude change.

Intrinsic motivation has been repeatedly linked to deeper, longer-lasting learning because an intrinsically motivated state, as described by researchers (Hennessey, 2015; Vansteenkiste, Lens, & Deci, 2006) results in deep focus, enhanced cognitive functioning, and task persistence. Other researchers (e.g., Mirvis, 1996) have speculated that the experience of flow also leads to longer-lasting and deeper learning; and, because of this fact, the research on flow has frequently been applied to the study of educational psychology (Beard, 2015). Quinn explains that flow can be conducive to learning in part because of the feedback inherent in the flow process, as people see what they have done or thought and again reevaluate their performance (Quinn, 2005).

Further, such research linking learning and creativity or learning and motivation is related to attitude change. In fact, the learning process and the process of attitude change have many important similarities. Attitude change has frequently been studied in the context of learning and education (e.g., Watson et al., 2016). In this literature, the term attitudinal learning refers to learning that involves student beliefs and attitudes (Watson et al., 2016). Like creativity, attitude change requires motivation in that people taking the central route to persuasion must be motivated to put in the cognitive effort required to do so. Just as it is with creativity, engagement

– referred to as elaboration in the Elaboration Likelihood Model – is essential. In the context of

the Elaboration Likelihood Model, Chmielewski (2012) defined motivation as "desire to process

the message" (p.35) and ability to mean "whether the individual can critically analyze or

evaluate the message" (p.35). Without sufficient motivation, the individual receiving the

message is not in the kind of high elaboration state necessary for attitude change via the central

route to take place; and, as a result, is far more likely to take the peripheral route (Bhattacherjee

& Sanford, 2006). The Elaboration Likelihood Model, in fact, focuses on the different contexts

in which a person would be more likely to take one route to persuasion over the other, and

motivation is an important part of that context (Bohner & Dickel, 2011). Further, motivation is

seen as important to attitude change because increases in effort expended during the attitude

change process leads to longer-lasting changes in that attitude (Bohner & Dickel, 2011). Without

intrinsic motivation, there is no successful attitude change or creativity.

The Added Layer of Cognitive Effort and Situational Context

As stated above, research has shown that people are more likely to engage in cognitive

effort, or "elaborate" on a persuasive argument, when they are motivated and able to do so. The

Elaboration Likelihood Model in fact argues that effective attitude change occurs when

"conditions foster motivation and ability to engage in issue-relevant thinking" (Cacioppo &

Petty, 1984, p.673) When a meta-analysis of three American political elections was run to test

the Elaboration Likelihood Model, results showed that voters took the central route to persuasion

when they were in a condition of high involvement (Chmielewski, 2012). The higher their

motivation and ability to elaborate, the more likely participants were to take the central route

(Chmielewski, 2012). The all-important role played by motivation and ability, as discussed

earlier, is a hallmark of the creativity literature as well. As Cacioppo (1984) explained, mere

intention to elaborate on an attitude change stimulus is not enough to result in attitude change; a person's motivation needs to be able to carry them through their thought process to arrive at attitude change, with considerable cognitive effort expended along the way. The same is true for creativity and getting all the way from the first spark of inspiration to the final production of a fully realized novel and appropriate product. In fact, studies have shown that increased cognitive effort does, in fact, often lead to increased creativity (e.g., Roskes, De Dreu, & Nijstad, 2012). Creativity requires focus, motivation, and energy. By the same token, if a persuasive argument is to successfully alter an individual's long-held opinion, that individual must do the difficult work of seeing things in new ways.

The Elaboration Likelihood Model framework is helpful because it explains how and why the same message can have different influences based on an audience's background and current situation. Importantly, the model does not consider the proclivity toward attitude change to be an individual difference trait or stable phenomenon. Instead, attitude change and the degree of evaluation an individual or audience is willing to engage in are seen to be dependent on specific situational variables (Bhattacherjee & Sanford, 2006). Such a temporal approach is similar to the little-c model of creativity. The similarity here rests in the fact that the conceptualization of both the process of creativity and the process of attitude change emphasize a dependence on environmental context. Like attitude change, creativity is not seen to be driven simply by individual difference variables. For example, research on the social psychology of creativity has created a large literature base supporting the notion that a great many contextual factors can influence creativity. Generally, such research focuses on the influence of environmental constraints and their ability to alter motivational orientation which, in turn, influences creative performance (Hennessey & Amabile, 2010). Both the creative process and

the process of attitude change are very much situational, with motivational orientation and

subsequent cognitive effort expended being dictated in large part by the situation.

Making Connections

Not only are creativity and attitude change modeled similarly in the literature, but

research shows that the creative process comes directly into play in attitude change via the

connecting of ideas and experiences that, in the mind of the individual, had up until this point

remained relatively separate. In fact, both attitude change and the creative generation of new

ideas or problem solutions involve the making of connections. For example, Bhattacherjee and

Sanford (2006) emphasize that the central route to persuasion frequently requires the combined

consideration of several arguments, some of which may be conflicting (Bhattacherjee & Sanford,

2006; Bohner & Dickel, 2011). The integration of multiple arguments plays an integral part in

the forming of a new, overall evaluation of an attitude object (Bhattacherjee & Sanford, 2006).

Like attitude change, the creative process is also very much a transformative activity in

that it involves making new connections between previously unrelated concepts and

understandings. It is a process that, at the surface level, is the act of producing a novel and

appropriate end product (e.g., Andreasen, 2005; Koestler, 1964). But below that surface, a

number of essential and intricate processes are taking place. One conceptualization of the

creative process (Zhang and Bartol, 2010) describes the stages of problem identification,

information searching (making the needed connections with the given information), and idea

generation. Other conceptions of creativity incorporate sudden leaps of insight and the

transformation of current norms (Weisberg, 1993). In other words, in the contemporary

literature, creativity is largely seen to involve the forming of connections or associations, as

exemplified in the popular models of bisociation (Koestler, 1965) and Synectics (Gordon, 1961).

Early on, the bisociation model was heavily criticized by social scientists for its lack of sound theoretical underpinnings and supporting empirical evidence (Eysenck, 1965). Still, Koestler's (1965) book, *The Act of Creation*, was a bestseller among popular audiences (Eysenck, 1965). Koestler (1965) proposed that the basis of all creativity, from breakthroughs in science to innovations in literary fields, is a result of making novel combinations between previously unrelated ideas. In other words, concepts coming from two different planes of thought that had been assumed to be incompatible are combined and result in creativity. In situations where these two planes manage to cross in the mind of the creator, the ideas are said to be bisociated, and that point of connection is the nexus of creativity.

Synectics is a problem-solving technique first developed in the 1950s as the result of analyses of recorded group conversations had by members of professional teams charged with coming up with creative ideas and problem solutions (Nolan, 2003). Synectics attempts to break down the creative process into several distinct steps, and this work / this model is most often applied in group situations similar to brainstorming sessions. The first stage of this process is centered on the suspended judgement of all ideas, as it is the most improbable and even nonsensical notions that may eventually become especially fruitful seeds of a final product. Next, constructive criticisms of these ideas are made; and, finally, the best idea is selected (Nolan, 2003). Importantly, Synectics emphasizes "the joining together of different and apparently irrelevant elements" (Gordon, 1961, p. 5), as metaphors and analogies are employed to combine previously unrelated ideas into unique, creative final outcomes (Gordon, 1961). Such conceptions of the creative process emphasize that creativity, in its overall conceptualization as a psychological process, is not simply the result of a random process or a series of random

happenstances that turn out well. Instead, creativity (like attitude change) requires a great deal of effortful cognitive processing.

Evaluation

Attitude change via the central route, and even to some extent the peripheral route, clearly requires the evaluation of new information and circumstances. An argument or series of arguments cannot be accepted or rejected until an evaluation has taken place. Perhaps less obvious is the role of evaluation in the creative process. Importantly, however, several research studies have shown that evaluation carried out within the mind of the creator during the creative process can and often does enhance creativity.

In a 2016 study using EEG recordings, researchers investigated how a self-evaluation of ideas generated can significantly and positively impact the creative process. Participants who took part in a reflection task, designed to engage them in a mental evaluation of their ideas, went on to generate further ideas that were judged to be more original than those produced by persons who, rather than reflecting on their initial ideas, performed a distraction task. These EEG findings led the researchers to propose that the mental evaluation process led participants to a "state of heightened internal attention" (Hao, Ku, Liu, Hu, Bodner, Grabner, & Fink, 2016, p. 30), which may have resulted in greater use of their memory and allowed them to access previously encoded ideas (Hao et al., 2016).

Again, the concept of flow can help to illustrate this creative process and explain further its connections to attitude change. In particular, the previously mentioned conceptualization of the flow state as "the experience of merging situation awareness with the automatic application of activity-relevant knowledge and skills" (Quinn, 2005, p. 610) is key to considering how creativity could be an important mechanism for attitude change. Quinn argues that flow is not an

example of automatic cognitive processing but, instead, requires deliberate, careful thought.

Quinn then goes on to explain:

> …situation awareness requires conscious, even vigilant cognitive processing; a person must continually review the circumstances to remain aware of elements in time and space, their meaning, and their possible status in the future. People do not simply act automatically in flow experiences but instead purposefully apply knowledge and skills. And this application can occur as much in intellectual work (such as solving mathematical proofs or writing software code) as it does in any physical actions... (Quinn, 2005, p. 615).

This same need to be thoughtful and, further, to revise thoughts as one's engagement in an activity progresses can also be readily applied to attitude change. This process is similar to the process of gradually shifting one's evaluation of or attitude toward an idea or an object.

Quinn also discusses how the process of flow frequently results in products that are appropriate, which is one of the two major requirements in most contemporary definitions of a creative product (Hennessey & Amabile, 2010; Rogers, 1954). He writes, "People consider a response to the unfolding circumstances of a situation to be appropriate when that response moves those circumstances closer to a desired end state" (Quinn, 2005, p. 615). Quinn further emphasizes the role of evaluation in flow, describing flow as "a string of such tiny, usually tacit evaluations, made in real time, as a person responds automatically to and maintains awareness of the unfolding circumstances of a particular situation" (Quinn, 2005, p. 616). Importantly, here, Quinn focuses only on the self-evaluation of one's own experience and one's level of success at a given task.

Quinn further suggests that flow is related to insight, with insight being "the recognition or restructuring of a key feature of a problem that allows a solution to be found" (MacGregor, Ormerod, & Chronicle, 2001, p.176). Again, insight and its role in the creative process can be related to attitude change. What Quinn describes as the "restructuring of a key feature of a problem" (Quinn, 2005, p.622) is reminiscent of conceptualizing attitude change as a shift in evaluation (Bohner & Dickel, 2011).

It is possible to pause here and further explore the role of self-evaluation in the creative experience. Specifically, a creative task could be designed that requires an individual to evaluate information relative to a persuasive message. The result of such a task could be both creativity and persuasion, attitude change brought about through the creative process.

Current Study

This overview of the theoretical and empirical literature has shown that that there are striking similarities in the ways that creativity and attitude change are modeled and observed to occur in both laboratory and more naturalistic contexts. The current study explores the proposition that engagement in the creative process can and should be seen as a viable route to attitude change. The study builds on a theoretical foundation that maintains that both creativity and attitude change necessitate motivation, ability, and effort, and rely on the establishment of connections and evaluations of those connections. Each of these processes have been shown to be crucial for attitude change or creativity to take place.

The primary purpose of the present investigation is to combine the exploration of creativity and attitude change in a single investigation in an effort to test the hypothesis that engagement in a creative activity can serve as a mechanism for attitude change. More

specifically, it is proposed that the activity of completing a creative task (making a collage in response to a persuasive argument) can lead individuals to follow a central route to persuasion.

After receiving a persuasive argument about the potential dangers of excessive non-academic Internet use, participants who create a collage about non-academic Internet use are expected to show a greater degree of attitude change than those who are not given the opportunity to engage in this creative task. The underlying assumption here is that study participants' engagement in this creative process will facilitate attitude change because they will be forced to closely and thoughtfully consider the information that is presented to them. As part of the creative process, participants in the creativity condition will need to be both motivated and engaged if they are to expend sufficient cognitive effort and make the connections necessary to produce a creative collage. This creative process, these connections made, are expected in turn, to serve to allow them to more fully explore and evaluate the persuasive arguments presented to them and eventually alter their attitudes.

Methods

Overview

A pilot study of 20 participants was conducted in an effort to hone the activities and instructions to be included in the actual experimental study, and to help determine a baseline of for student participants' attitudes toward non-academic Internet use on campus. The experimental study took the form of a 2x2 factorial between-subjects design, with the independent variables Task (creative task/control task) and Video Message (persuasive video/non-persuasive video). All participants watched one video, and completed one computer task (with both tasks involving the same images).

Non-academic Internet Use

The persuasive argument presented to study participants focused on non-academic Internet use on campus. More specifically, the persuasive video aimed to persuade participants that students should be mindful of their non-academic Internet use, that excessive non-academic Internet use was, in fact, a real concern and problem for some students on campus, and that all students should limit their non-academic Internet use.

The potential dangers associated with non-academic Internet use were, of course, not the focus of the study. Instead, non-academic Internet use was selected as the attitude change stimulus because it was determined that this topic is relevant and of interest to virtually all students.

Procedure

All participants were informed that the study investigated Internet use and information processing. Participants were told at the beginning of the study that they would be completing questionnaires, watching a video, and engaging in a computer-based activity. All participants signed an informed consent form.

Participants began the study session by completing questionnaires. There was no time limit for this portion of the session. Most participants spent about 10 minutes completing these initial measures, which included the Internet Feelings and Internet Self-Efficacy scales, discussed below.

Next, all participants watched a video. The video presented was either a control video, a TED talk about how the Internet operates (*What Is the Internet, Really?*), or a video, created specifically for this study, about the dangers of excessive non-academic Internet use on campus. The control video lasted 7 minutes and 56 seconds. This second, persuasive video included a

series of interviews with several class deans, and the director of the tutoring center on campus. The persuasive video lasted 7 minutes and 41 seconds.

After viewing either the control or the persuasive video, all participants completed a computer-based activity for 15 minutes. Participants in the creativity condition completed an online collage-making activity and were told to be creative. This task was accomplished with the help of online collage-maker software (http://www.photocollage.com/), a user-friendly website that allowed participants to create collages by uploading, rotating, resizing, and cropping images. Participants could also take advantage of other features of the website, such as options to add text and borders. Participants were allowed to use any and all aspects of the collage maker. They were, however, instructed to use only images from a predetermined image bank containing total of 25 clip art images, 25 black and white photos, and 25 color photos stored on the computer desktops. All study participants were given identical images with which to work and it was made clear that they were not to search the Web for additional images.

Participants in the control condition used the same images and same number of images to complete a photo-sorting activity on the computer. More specifically, they were instructed to sort the images in terms of how appealing they found them to be, and also in terms of image quality. Participants had 15 minutes to sort six image grids total.

After the computer activity was finished, participants responded to a second round of questionnaires. Again, there was no time limit for completing this segment of the study. Most participants spent about 15 minutes filling out these measures.

Demand characteristics prohibited the researchers from giving the same attitude change measures twice in this one-hour-long study session. As a result, assessments of attitude from the

pilot study were used as a baseline for comparison to participant responses in the experimental

conditions.

Participants

   Participant race/ethnicity. Participants in this study were all undergraduate students

attending a selective liberal arts college in New England. Ninety-nine percent of these students

identified as women. The response format for questions tapping racial/ethnic identity allowed

participants to identify with one or more groups. Seventy-three of the 100 study participants

(73%) chose only one response category, 17 (17%) identified with two distinct racial/ethnic

groups and 2 participants (2%) chose three distinct options. Eight participants (8%) chose not to

give any racial/ethnic information. Forty-one participants (41%) identified as White/Caucasian;

23 (23%) identified as Asian-American; 11 (11%) as East Asian; 7 (7%) as South Asian; 2 (2%)

as South-East Asian; 8 (8%) as Latina/Latino; 5 (5%) as Central American; 3 (3%) as South

American; 5 (5%) as African American; 4 (4%) as African-Caribbean; 3 (3%) as African

Continent; 3 (3%) as Middle Eastern; and 1 (1%) as European Continent.

   Participant recruitment. Participants volunteered to take part in the study and received

credit for research participation as part of their psychology course requirement. All participants

signed an informed consent form, were informed that they were free to choose not to answer any

questionnaire items that might make them feel uncomfortable, and were debriefed at the end of

the session.

   Participants were run in various sized groups, with an upper limit of 10 people per group,

depending on how many students signed up for any given experimental session. All of the

sessions lasted 40-50 minutes.

Measures

Internet Feelings. As part of the first round of questionnaires, an eight-question measure asked participants to use a 7-point Likert scale to indicate how strongly thinking about non-academic Internet use made them feel each of the following emotions: uncomfortable, excited, frustrated, eager, reluctant, positive, at ease, and concerned. On the Likert scale, 1 was labeled as *Not at all,* and 7 was labeled as *Very much.* Later, in the second round of questionnaires, after watching the video, participants were presented with the same instructions and responded to eight synonyms for the emotions listed on the first measure, using the same 7-point Likert scale: uneasy, thrilled, exasperated, willing, hesitant, favorable, relaxed, and worried. This measure was given pre and post treatment.

Internet Self-Efficacy Scale. Internet use and comfort was measured using the Internet Self-Efficacy Scale (Joyce & Kirakowski, 2015), This self-assessment did not directly address attitudes towards Internet use, but instead asked respondents to report on their feelings of efficacy surrounding Internet use. Towards this end, respondents were asked to indicate how often they pursue a variety of different activities on the Internet. In addition, they indicated how confident they were that that could do each of the given Internet activities right now. The activities rated were: communication, social networking/personal involvement, obtaining information, entertainment/media consumption, shopping/buying items, e-commerce, booking events/trips, financial services, blogging/contributing to websites/discussion boards, and education and training. This measure was completed pre-treatment.

Attitudes Towards Non-Academic Internet Use. Participants responded to three statements about non-academic Internet use, indicating on a 7-point Likert scale how much they agreed with each. More specifically, the statements rated were: Non-academic Internet use is a

concern on campus, Students should be mindful of their non-academic Internet use, and Students should limit their non-academic Internet use. This measure was completed post treatment.

General Internet Attitudes Scale. The General Internet Attitudes Scale (Joyce & Kirakowski, 2015) was a 21-item inventory that measured attitudes towards the Internet. This inventory was composed of four subscales assessing attitudes about: Internet Affect, Internet Exhilaration, Social Benefit of the Internet, and Internet Detriment. The inventory listed 21 statements and asked participants to indicate how strongly they agreed with each. For the purpose of this investigation, participants were instructed to specifically "Think about non-academic Internet use". Examples of statements rated were: The Internet makes a great contribution to human life and I feel intimidated by the Internet. This measure was completed post treatment.

Belief-based Attitude Towards Reducing Internet Use. Participants completed the Belief-based Attitude Towards Reducing Internet Use scale (Ajzen 1991; Byrne and Arias 2004). In this measure, they were asked to indicate "the likelihood that reducing your Internet use would result in each of these 10 different outcomes" and responded to those outcomes on a 7-point Likert scale. Next, participants were asked to indicate "how good or bad each of the 10 possible outcomes presented would be for you," and, again, responses were made using a 7-point Likert scale. The 10 outcomes listed were: Free up my time, Allow me to develop normal relationships with friends, Help me improve my academic achievement, Reduce my stress, Improve my mood, Reduce my negative feelings, Help improve my life, Enable me to be a better person, Enhance my effectiveness, and Make it easier to manage my life. This measure was completed post treatment.

Behavior Change Intention. Participants were presented with five actions aimed at reducing non-academic Internet use and were asked to indicate "how likely you are to take the following actions, starting today…". The actions listed were: Reduce your non-academic Internet use, Encourage a friend to reduce their non-academic Internet use, Seek resources on campus related to managing non-academic Internet use for yourself, Seek resources on campus related to managing non-academic Internet use for a friend., and Talk about what you did or learned in this study about non-academic Internet use, or the Internet. Again, a 7-point Likert scale was used, with anchors ranging from 1 (*not at all likely*) to 7 (*very likely*). This measure was completed post treatment.

Internet Addiction Test. Participants also completed the Internet Addiction Test (Young, 1998). The Internet Addiction Test was a 20 item inventory that asked questions about Internet use and the impact of that use on a participant's life. Responses were made on a five-point Likert scale, with the anchors *Not Applicable* (1) and *Always* (5). Examples of questions are: How often do you find that you stay online longer than you intended? and How often do you try to hide how long you've been online? Overall scores for this measure were calculated as a sum across all responses, and were then categorized into four levels of Internet addiction: none, mild, moderate, and severe. This measure was completed post treatment.

Manipulation Checks. Participants were administered several manipulation checks to ensure experimental realism and to inquire about baseline traits such as how easily they change their minds and how creative they believe themselves to be. Manipulation check responses were made on 7-point Likert scales, with the anchors *Not At All* and *Very*. These questions included: How persuasive was the video you watched?, How engaged were you in the computer activity?, How hard did you try in the computer activity?, How creative were you in your computer

activity?, How proud are you of your final product from the computer activity?, How much does

your final product from the computer activity reflect your creative ability?, Would you repeat the

computer activity in the future?, How easily do you change your mind?, and How creative are

you? These checks were administered post treatment.

Participants were also asked to respond to three open-ended questions: How did you feel,

and what were you thinking, when you were doing the computer activity?, What do you think

this study was about?, and What was the video you watched about? These questions were asked

post treatment.

Finally, participants were asked about the video they had watched. Responding using 7-

point Likert scales with the anchors *Not at All* and *Very Much* to: To what extent did the video

you watched ... Make you think about non-academic Internet use at Wellesley?, Make you think

about your personal non-academic Internet use at Wellesley, and Make you want to seek

resources related to the Internet? This question was asked post treatment. See Appendix A.

Collage Creativity Scores. Judges were recruited to rate the creativity of collages using

the Consensual Assessment Technique (Hennessey, Amabile, & Mueller, 2011). Eight judges, all

of whom were peers of the participants were recruited. All judges were college-aged students at

the same institution who had shown interest in art as evidenced by their decision to take one or

more art classes.

<div align="center">

Results

</div>

Internet Use

Results from the Internet Self-Efficacy Scale showed that study participants' highest

levels of Internet use were in the areas of entertainment/media consumption ($M = 4.63$, $SD =$

.58), obtaining information ($M = 4.63$, $SD = .60$), and communication ($M = 4.43$, $SD = .79$). In

light of the study's focus on non-academic Internet use, it is noteworthy that "education and

training" was also a category available for selection on the questionnaire, yet participants chose

this option with far less frequency. This fact leads to the conclusion that, for many study

participants, the selection of the "obtaining information" category should not be seen as an

indication that this frequently chosen reason for using the Internet was seen by participants as

mapping onto situations where information is being gathered to be used for course-related

educational purposes. The full range of Internet categories and their average frequency of use

(possible responses range from 1-5) are listed in Table 1.

Table 1

Frequency of Various Area of Internet Use

Use	*M*	*SD*
Entertainment/media consumption	4.63	.58
Obtaining information	4.62	.60
Communication	4.43	.79
Social networking/personal involvement	4.25	.92
Shopping/buying items	3.53	.97
Education and training	3.34	1.11
Financial services	2.96	1.20
Booking events/trips	2.94	1.13
E-commerce	2.21	1.06
Blogging/contributing to websites/discussion boards	2.18	1.12

Note. This table shows the mean frequency of various Internet uses among study participants. Responses ranged from 1 (Never) to 5 (Very often).

Confidence in Internet Use

Results from the Internet Self-Efficacy Scale also showed that participants were most confident in their ability to use the Internet for entertainment/media consumption ($M = 6.49$, $SD = .84$), communication ($M = 6.27$, $SD = 1.10$), and obtaining information ($M = 6.26$, $SD = .81$). In total, study participants were asked to indicate their confidence with 10 different areas of

Internet use, with possible responses ranging from 1-7. Each of these areas and study

participants' corresponding mean confidence levels are listed in Table 2. Many of these Internet

areas show means above five (the score value indicating "Considerable Confidence"). Overall,

participants in this study showed high levels of confidence in their ability to use the Internet for a

variety of activities online, both academic (e.g., education and training) and non-academic

(entertainment/media consumption).

Table 2

Confidence in Ability to Use the Internet in Various Ways

Use	*M*	*SD*
Entertainment/media consumption	6.49	.84
Communication	6.27	1.1
Obtaining information	6.26	.81
Shopping/buying items	6.15	1.08
Education and training	5.29	1.49
Booking events/trips	5.13	1.52
Social networking/personal involvement	5.74	1.42
Blogging/contributing to websites/discussion boards	4.67	1.88
Financial services	4.48	1.67
E-commerce	4.02	1.86

Note. This table shows the mean level of confidence for areas of Internet use. Responses ranged from 1 (*Not at all confident*) to 7 (*Completely confident*).

Participant Internet Self-Efficacy

Total scores for Internet Self-Efficacy, or ability to use the Internet, were computed using data from the frequency of use and confidence of use measures (Joyce, 2013). In this calculation, 0 is the lowest possible score, and indicates low Internet Self-Efficacy. One hundred is the highest possible score, and indicates high Internet Self-Efficacy. Overall, the participants in this investigation demonstrated a mean Internet self-efficacy ($M = 56.61$, $SD = 14.29$) that was similar to the mean reported for female Internet users by the researchers who had constructed the original measure ($M = 57.28$, $SD = 16.91$) (Joyce, 2013).

Internet Addiction

The Internet Addiction Test (IAT) was used to screen participants for Internet addiction. A 2012 administration of the IAT to 215 US college students yielded a mean score of 28.4, with a standard deviation of 10.3. Problematic Internet use is typically operationalized by an IAT score of 40 or above. Following this guideline, the 2012 study found that 12% of participants were problematic users (Jelenchick, Becker, & Moreno, 2012). A 2012 study of 60 college student participants recruited online found a mean IAT score of 28.30, with a standard deviation of 16.06. Using the same 40-point score cutoff, 28% of participants in this investigation were categorized as being problematic Internet users (Reed, Osborne, Romano, & Truzoli, 2015).

The present study found a mean IAT score of 56.69, with a standard deviation of 12.12. Following the 40-point score cutoff, a full 91.9% of participants in this investigation fall into the categorization of being problematic Internet users.

An alternative approach to scoring the IAT is to categorize participants in terms of the severity of their Internet addiction (Young, 1998). Under this system, participants can be categorized as showing no Internet addiction (with a score of 0-30), mild addiction (31-49),

moderate addiction (50-79), or severe (80-100) Internet addiction. Employing this scoring

procedure in the present investigation, two study participants (2%) showed no Internet addiction,

24 participants (24%) demonstrated mild Internet addiction, 69 participants (69%) demonstrated

moderate Internet addiction, and four participants (4%) demonstrated severe Internet addiction.

One participant chose not to complete the IAT questionnaire.

      These results indicate an unusually high level of Internet addiction within the study

sample. Here, it is important to emphasize that participants were not selected into the study on

the basis of their levels of Internet use. Instead, this fairly racially/ethnically diverse sample self-

selected to participate in this study in partial fulfillment of a research participation requirement

tied to one or more psychology courses in which they were enrolled. While it is possible that

students who have problematic Internet use might be especially inclined to choose to participate

in a study entitled "Internet Use and Information Processing," anecdotal information from

participants indicated that students tend to select studies for participation credit based on whether

or not the research times happen to fit within their schedules. For more exploration of these

surprising Internet addiction results, see the Discussion section.

General Internet Attitudes Scale

      The General Internet Attitudes Scale was originally included in the study to serve as a

dependent measure. However, two-way analyses of variance (ANOVAs) revealed no significant

main effect of Video ($F(1, 96) = .09$, $p = .76$), no significant main effect of Task ($F(1, 96) = .01$,

$p = .94$), and no significant interaction effect ($F(1, 96) = .02$, $p = .90$). In other words,

experimental manipulations had no significant impact on study participants' scores. These results

coupled with a more careful review of how this measure has been traditionally employed in the

literature led to the conclusion that the GIAS is most appropriately seen as an index of stable,

rather than situation-specific, attitudes. For this reason, as will be discussed later, it was decided
to enter GIAS scores as a covariate in some analyses.

Importantly, while the GIAS was originally formulated as a measure of overall attitudes
toward the Internet, participants in the present investigation were asked to consider the specifics
of non-academic Internet use when responding to the test items. Still, overall, the means found in
this study population were similar to the means found in previous research employing the GIAS
(Joyce, 2013).

Manipulation Checks

Video persuasiveness and task experience. Manipulation checks were run to determine
whether the persuasive video, as compared to the control video, was truly persuasive, and to see
whether the creative collage-making task truly required more creativity than did the control
photo sorting task.

An independent-samples *t*-test showed a significant difference in the self-reports made by
participants who watched the persuasive video and participants who watched the control video.
Study participants who watched the persuasive video reported thinking about non-academic
Internet use at their school while watching the video with significantly greater frequency ($M =$
4.88, $SD = 1.80$) than did participants who watched the control video ($M = 2.20$, $SD = 1.60$),
$t(96) = 7.79$, $p < .001$; $d = .79$.

Similarly, an independent-samples *t*-test showed a significant difference between
participants who watched the persuasive video ($M = 5.22$, $SD = 1.67$) and participants who
watched the control video ($M = 2.69$, $SD = 1.80$) for self-reports of the extent to which the video
they watched made them think about their own non-academic Internet use on campus, $t(97) =$
7.28, $p < .001$; $d = .74$.

An independent-samples *t*-test showed no significant difference between participants who watched the persuasive video and participants who watched the control video for self-reports of the extent to which the video they watched made them "want to seek resources related to the Internet" ($t(97) = 1.35$, $p = .18$). This lack of a significant difference between groups on this measure was unexpected, as the persuasion video included information about resources that can help with Internet addiction and also offered concrete suggestions as to how to limit non-academic Internet use. This finding may illuminate the lack of significant findings for behavior change intention, reported and discussed later.

Additional independent-samples *t*-tests exploring other self-report variables also failed to reveal significant differences between conditions. Ratings for persuasiveness given to the persuasion video by its viewers were no higher than ratings for persuasiveness given the control group video by its viewers. Similarly, there were no significant differences between study participants who made a collage and participants who sorted photos on self-reports of task engagement, effort expended, demonstrated creativity, pride in finished product, etc. (see Table 3). This failure to find significant between-group differences in self-reports is likely a result of the fact that, when making their assessments of a video or computer activity, participants had no other activity (or video) to compare their experience to.

Table 3

Non-Significant Manipulation Check t-Tests

Manipulation Check	df	t	p
How persuasive was the video you watched?	97	.98	.33
How engaged were you in the computer activity?	97	-.17	.87
How hard did you try in the computer activity?	96	.48	.64
How creative were you in the computer activity?	96	.38	.70
How proud are you of your final product from the computer activity?	96	-.14	.89
How much does your final product from the computer activity reflect your creative ability?	97	.36	.72
Would you repeat the computer activity in the future?	97	-.61	.55

Note. This table shows non-significant *t*-test results for the manipulation checks. All of the manipulation checks for the Task conditions showed no significant differences between groups.

Random assignment of subject variables. Manipulation checks were also run to

determine whether several subject variables were randomly distributed across conditions.

Participants were asked to report their self-perceived general level of creative talent,

operationalizing creativity as a relatively stable trait. An independent-samples t-test showed no

significant differences between levels of self-reported creativity for participants randomly

assigned to sort the photos and those who were randomly assigned to the collage-making group

($t(97) =. 59$, $p = .56$). This result demonstrates that self-reported creativity levels were indeed

randomly distributed across the two task conditions. An independent-samples t-test showed no

significant differences between levels of self-reported ability to change one's mind across Video

conditions ($t(97) = -.62$, $p = .54$). This result demonstrates that self-reported flexibility in

attitudes was indeed randomly distributed across the two video conditions.

A two way analysis of variance (ANOVA) showed that there were no significant

differences in participants' self-reported levels of confidence in using the Internet across Video

conditions ($F(1, 96) = .49$, $p = .49$), no significant differences across Task conditions ($F(1, 96) =$

.10, $p = .76$), and no significant interaction ($F(1, 96) = .04$, $p = .84$). These results show that

participants' confidence in their Internet use was indeed randomly distributed across all

conditions.

A two way analysis of variance (ANOVA) showed that there were no significant

differences in participants' self-reported frequency of Internet use across Task conditions ($F(1,$

$96) = .28$, $p = .60$) and no significant interaction effect ($F(1, 96) = .31$, $p = .31$). However, there

was a significant main effect of Video ($F(1, 96) = 4.96$, $p = .03$; $d = .05$). Participants reported

greater frequency of Internet use in the persuasive video condition ($M = 36.24$, $SD = 5.58$) than

in the control video condition ($M = 33.72$, $SD = 5.70$). This significant between-group difference

in self-reported Internet use emerged despite the fact that participants were randomly assigned to

the persuasive and control video conditions. However, because frequency of Internet use was not

significantly correlated with the total score on the Internet Addiction Test ($r = .19$, $p = .07$), with

the classification of Internet Addiction level ($r = .05$, $p = .64$), or with the aggregated sum for the

General Internet Attitudes Scale ($r = -.11$, $p = .27$), it is unlikely that this unevenly distributed

subject variable served to significantly influence experimental results.

Reliability Analyses

      Internet Addiction Test. The Internet Addiction test was found to be highly reliable,

with Chronbach's alpha calculated across 20 items at .88.

      General Internet Attitudes Scale. The GIAS was also found to be highly reliable, with

Chronbach's alpha of .85 for its 21 items.

      Internet Self-Efficacy Scale. The Internet Self-Efficacy Scale was similarly found to be

reliable in both its Frequency of Use and Confidence scales, with Chronbach's alphas of .80 and

.84, respectively.

      Internet Feelings Intensity (for measures taken after treatment). Chronbach's alpha

calculated across all of the Internet Feelings items completed post treatment, after the negative

affect items were reverse coded, was .75. Chronbach's alpha for all of the negative affect items

completed post treatment was .87, and Chronbach's alpha for all of the positive affect items

completed post treatment was .83.

Attitude Change

      Video Message Effects (assessments post videos). A two-way (Video X Task) analysis

of variance (ANOVA) showed that there was a significant main effect of Video (persuasion vs.

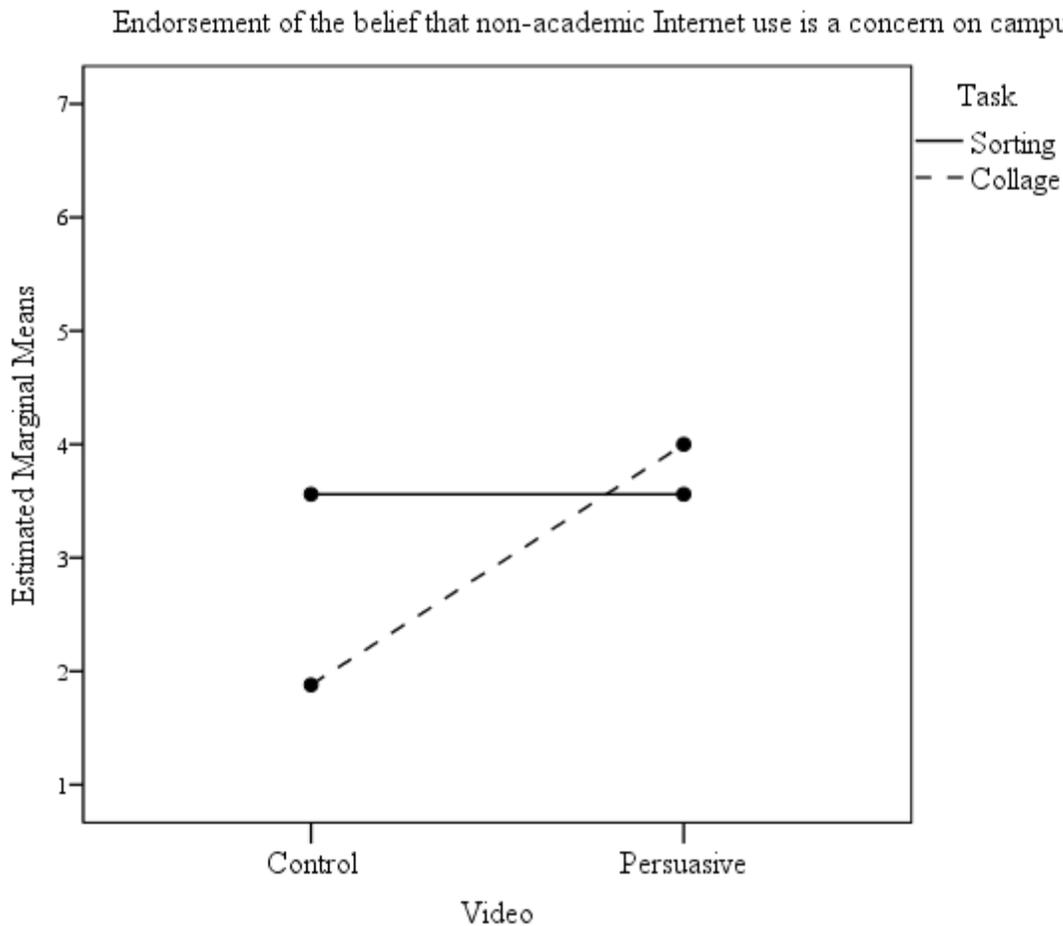control) on participants' belief that non-academic Internet use is a concern on campus ($F(1, 95) =$

12.62, $p = .001$). When compared to participants who had viewed the control video, participants who had viewed the persuasive video were significantly more likely to believe that non-academic Internet use is a concern on campus. Responses on this measure were made using 5-point Likert scales, (persuasive group $M = 3.78$, $SD = 1.46$) (control group $M = 2.76$, $SD = 1.67$). These results help to demonstrate the overall persuasiveness of the video. There was also a significant main effect of Task (collage vs. sorting) ($F(1, 95) = 4.21$, $p = .04$). Participants who had sorted images on the computer ($M = 3.56$, $SD = 1.64$) were significantly more likely than participants who had made a collage ($M = 2.28$, $SD = 1.60$) to believe that non-academic Internet use is a concern on campus.

Additionally, there was found a significant Video X Task interaction effect ($F(1, 95) = 12.62$, $p = .001$). Participants who viewed the persuasive video were more likely to believe that non-academic Internet use was a concern when they had created a collage ($M = 4.00$, $SD = 1.35$) rather than when they had sorted images ($M = 3.56$, $SD = 1.56$). These results may well demonstrate the potential for creative engagement to augment the impact of persuasion, and the ability of the creative process alone to miss the mark for a persuasive message's goal when the creative task does not incorporate a persuasive message. In the control condition, however, participants were more likely to believe that non-academic Internet use was a concern when they had sorted images ($M = 3.56$, $SD = 1.76$) than when they had created a collage ($M = 1.92$, $SD = 1.06$). See Figure 1.

Next, independent t-tests were run to determine which specific group means were significantly different from each other. The mean score for the control Video and sorting Task condition ($M = 3.56$, $SD = 1.76$) and the mean score for the persuasive Video and sorting Task ($M = 3.56$, $SD = 1.56$) were not statistically different; $t(48) = 0$, $p = 1.00$. The mean score for the

control Video and sorting Task and the mean score for the control Video and collage Task were significantly different ($t(48) = 4.10$, $p < .001$; $d = .58$), with participants endorsing the belief that non-academic Internet use is a problem on campus more strongly after sorting images ($M = 3.56$, $SD = 1.76$) than after creating a collage ($M = 1.92$, $SD = 1.06$). The mean score for the control Video and collage Task and the persuasive Video and collage Task condition also showed significant differences ($t(48) = 6.18$, $p < .001$, $d = .84$), with participants more strongly endorsing the belief that non-academic Internet use is a problem on campus after watching the persuasive video and making a collage ($M = 4.00$, $SD = 1.35$) than after watching the control video and creating a collage ($M = 1.92$, $SD = 1.06$). Finally, while participants in the persuasive Video and collage Task condition endorsed the persuasive message more strongly ($M = 4.00$, $SD = 1.35$) than did participants in the persuasive Video and sorting Task condition ($M = 3.56$, $SD = 1.56$). these differences were not statistically significant; $t(48) = 1.07$, $p = .29$. Similarly, there were no statistically significant differences between the endorsements given by participants in the control Video and sorting Task condition ($M = 3.56$, $SD = 1.76$) and the persuasive Video and collage Task condition ($M = 4.00$, $SD = 1.35$); $t(48) = .99$, $p = .33$.

Figure 1

Endorsement of the belief that non-academic Internet use is a concern on campus.

Figure 1. This graph shows the interaction effect for awareness/endorsement of non-academic Internet use being a problem on campus. Participants in the collage Task condition reported the strongest level of awareness/endorsement of the concern after watching the persuasive video.

A two-way (Video X Task) analysis of variance (ANOVA) showed that there was a significant main effect of video exposure on participants' belief that students should be mindful of their non-academic Internet use ($F(1, 95) = 6.95$, $p = .01$). Participants who viewed the persuasive video ($M = 5.62$, $SD = 1.24$) believed more strongly than participants who had viewed the control video ($M = 4.82$, $SD = 1.76$) that students should be mindful of their non-academic Internet use. There was no significant main effect found for Task ($F(1, 95) = 1.15$, $p = .29$), and no significant interaction effect ($F(1, 95) = .46$, $p = .50$) on this measure. It is possible that the

lack of main effect for computer activity and the lack of a significant interaction reflect a ceiling

effect, as the mean responses for participants in the collage condition ($M = 5.06$, $SD = 1.57$) and

the sorting condition ($M = 5.38$, $SD = 1.56$) were both relatively high.

A two-way (Video X Task) analysis of variance (ANOVA) showed that there was a

significant main effect of video exposure on participants' belief that students should limit their

non-academic Internet use ($F(1, 95) = 6.08$, $p = .02$). Participants who had watched the

persuasive video ($M = 4.78$, $SD = 1.52$) believed more strongly that students should limit their

non-academic Internet use than did participants who had seen the control video ($M = 4.02$, $SD = $

1.52). There was no significant main effect of Task ($F(1, 95) = .07$, $p = .80$), and no significant

interaction effect ($F(1, 95) = .43$, $p = .51$).

Belief-based behavior change. The analyses of variance (ANOVAs) run to determine

whether there were any between-group differences in belief-based behavior change yielded only

one significant result. There was a significant main effect of Video on study participants' belief

that a reduction in non-academic Internet use would allow them to develop more normal

relationships with friends ($F(1, 94) = 3.94$, $p = .05$; $d = .04$). Participants who viewed the control

video ($M = 20.94$, $SD = 12.60$) were significantly more likely to take this view than were

participants who watched the persuasive video ($M = 16.20$, $SD = 11.56$). See Table 4 to see the

full findings from this measure. The Behavior Change Intention measure, similarly, was not

significant. For the sake of parsimony, the Behavior Change Intention measure results are not

reported here.

Table 4

*Non-Significant Belief-Based Behavior Change ANOVAs*

Outcome	df	F	p
Free up my time	(1, 94)	Video: .65 Task: 1.05 Interaction: .08	Video: .42 Task: .31 Interaction: .77
Allow me to develop normal relationships with friends	(1, 94)	Task: .11 Interaction:	Task: .74 Interaction: .80
Help me improve my academic achievement	(1, 94)	Video: .62 Task: 1.46 Interaction: .37	Video: .43 Task: .23 Interaction: .54
Reduce my stress	(1, 93) (1, 94) (1, 94)	Video: .18 Task: .47 Interaction: 1.19	Video: .67 Task: .50 Interaction:.28
Improve my mood	(1, 94)	Video: .75 Task: .95 Interaction: .28	Video: .39 Task: .33 Interaction: .60
Reduce my negative feelings	(1, 95)	Video: .17 Task: .08 Interaction: .73	Video: .68 Task: .78 Interaction: .40
Help improve my life	(1, 93)	Video: .06 Task: .02 Interaction: 1.24	Video: .81 Task: .88 Interaction: 1.24
Enable me to be a better person	(1, 94)	Video: .13 Task: .01 Interaction: .25	Video: .72 Task: .91 Interaction: .25
Enhance my effectiveness	(1, 95)	Video: .03 Task: 1.70 Interaction: .25	Video: .87 Task: .20 Interaction: .62
Make it easier to manage my life	(1, 95)	Video: .01 Task: .04 Interaction: .04	Video: .92 Task: .85 Interaction: .85

Note. Across all experimental conditions, there were found no significant differences for any of these measures of belief-based behavior change for non-academic Internet use.

Internet Feelings. A series of 2 x 2 analyses of covariance (ANCOVAs) were conducted to determine the influence of the independent variables Video (persuasive message) and Task (computer activity) on participants' self-reported feelings about non-academic Internet use. GIAS scores were used as the covariate to control for individual differences in participants' broad, stable views of the Internet as a whole.

Preliminary checks were conducted to ensure that assumptions of the normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of GIAS scores were not violated. See Figure 2.

Figure 2
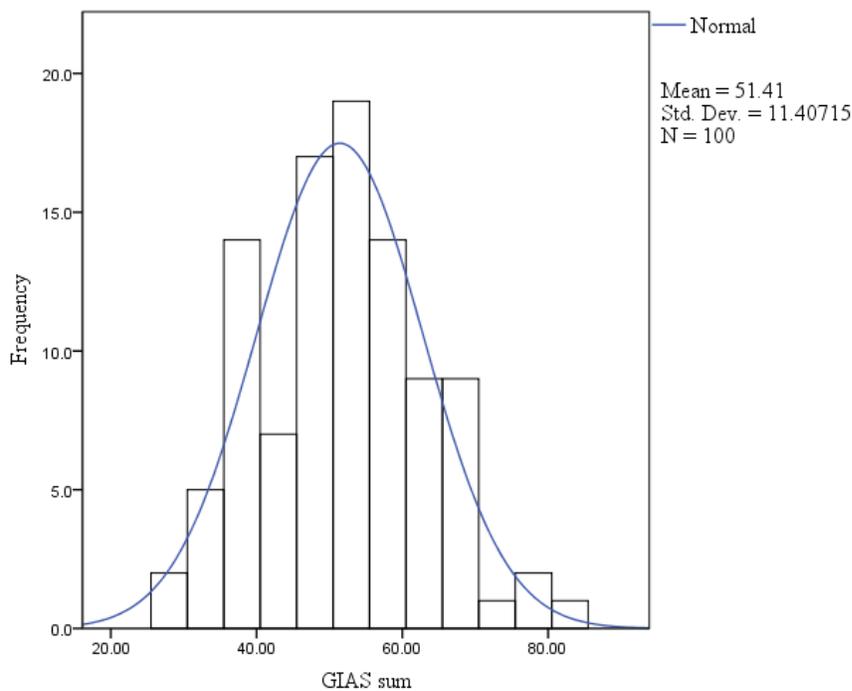
Note. This graph shows the distribution of sums on the General Internet Attitudes scale, with a normal curve superimposed. The GIAS total sum was used as a covariate in ANCOVAs with Internet Feelings measures as dependent measures.

An analysis of covariance (ANCOVA) showed that there was a significant main effect of Video on participants feeling uneasy when thinking about non-academic Internet use ($F(1, 95) =$

4.30, $p = .04$; $d = .04$). Participants felt more uneasy when thinking about non-academic Internet use after watching the persuasive video ($M = 2.70$, $SD = 1.81$) than after watching the control video ($M = 2.12$, $SD = 1.30$). There was no significant main effect of Task ($F(1, 94) = .09$, $p = .77$) and no significant interaction effect ($F(1, 95) = .00$, $p = .98$).

An analysis of covariance (ANCOVA) showed that there was a significant main effect of Task on participants feeling willing, which should be interpreted as meaning willing to use the Internet, when thinking about non-academic Internet use ($F(1, 95) = 6.76$, $p = .01$; $d=.07$). Participants felt more willing when thinking about non-academic Internet use after sorting images ($M = 4.36$, $SD = 1.84$) than after making a collage ($M = 3.46$, $SD = 1.68$). There was no significant main effect for Video ($F(1, 95) = .11$, $p = .74$), and no significant interaction effect ($F(1, 95) = 2.71$, $p = .10$).

An analysis of covariance (ANCOVA) showed that there was a significant main effect of Task on participants feeling favorable when thinking about non-academic Internet use ($F(1, 95) = 7.45$, $p = .01$; $d = .07$). Participants felt more favorable when thinking about non-academic Internet use after sorting images ($M = 4.48$, $SD = 1.62$) than after making a collage ($M = 3.60$, $SD = 1.73$). There was no significant main effect of Video ($F(1, 95) = .00$, $p = .97$) and no significant interaction effect ($F(1, 95) = 1.74$, $p = .19$).

An analysis of covariance (ANCOVA) showed that there was a significant main effect of Video on participants feeling hesitant when thinking about non-academic Internet use ($F(1, 95) = 3.98$, $p = .05$; $d = .04$). Participants felt more hesitant when thinking about non-academic Internet use after watching the persuasive video ($M = 2.80$, $SD = 1.82$) than after watching the control video ($M = 2.22$, $SD = 1.06$). There was no significant main effect of Task ($F(1, 95) = .11$, $p = .70$), however there was found a marginally significant interaction effect

($F(1, 95) = 3.56$, $p = .06$; $d = .04$). Participants who watched the persuasive video felt more

hesitant when thinking about non-academic Internet use when they had made a collage ($M =$

3.00, $SD = 1.80$) than when they had sorted images ($M = 2.60$, $SD = 1.85$). Participants who

watched the control video felt more hesitant when they had sorted images ($M = 2.52$, $SD = 1.05$)

than when they had made a collage ($M = 1.92$, $SD = 1.00$). See Figure 3.

Next, independent t-tests were conducted to determine if the differences between means

were statistically significant. The results followed the same pattern as the interaction effect for

the endorsement of the message that non-academic Internet use is a concern on campus. The

mean score for the control Video and sorting Task condition ($M = 1.92$, $SD = 1.00$) and the mean

score for the persuasive Video and sorting Task ($M = 2.60$, $SD = 1.85$) were not statistically

different; $t(48) = .19$, $p = .85$. The mean score for the control Video and sorting Task and the

mean score for the control Video and collage Task were significantly different ($t(48) = 2.07$, $p =$

.04; $d = .29$), with participants feeling more hesitant when thinking about non-academic Internet

use after sorting images ($M = 2.52$, $SD = 1.05$) than after creating a collage ($M = 1.92$, $SD =$

1.00). The mean score for the control Video and collage Task and the persuasive Video and

collage Task condition also showed significant differences ($t(48) = 2.62$, $p = .01$, $d = .37$), with

participants feeling more hesitant when thinking about non-academic Internet use after watching

the persuasive video and making a collage ($M = 3.00$, $SD = 1.80$) than after watching the control

video and creating a collage ($M = 1.92$, $SD = 1.00$). Finally, while participants in the persuasive

Video and collage Task condition rated themselves as feeling more hesitant ($M = 3.00$, $SD =$

1.80) than did participants in the persuasive Video and sorting Task condition ($M = 2.60$, $SD =$

1.85), this difference was not statistically significant; $t(48) = .77$, $p = .44$. Similarly, there was no

statistically significant difference in self-reports of hesitancy between participants in the control

Video and sorting Task condition (*M* = 2.52, *SD* = 1.05) and the persuasive Video and collage

Task condition (*M* = 3.00, *SD* = 1.80); *t*(48) = 1.15, *p* = .26.

Figure 3

Feeling hesitant when thinking about non-academic Internet use
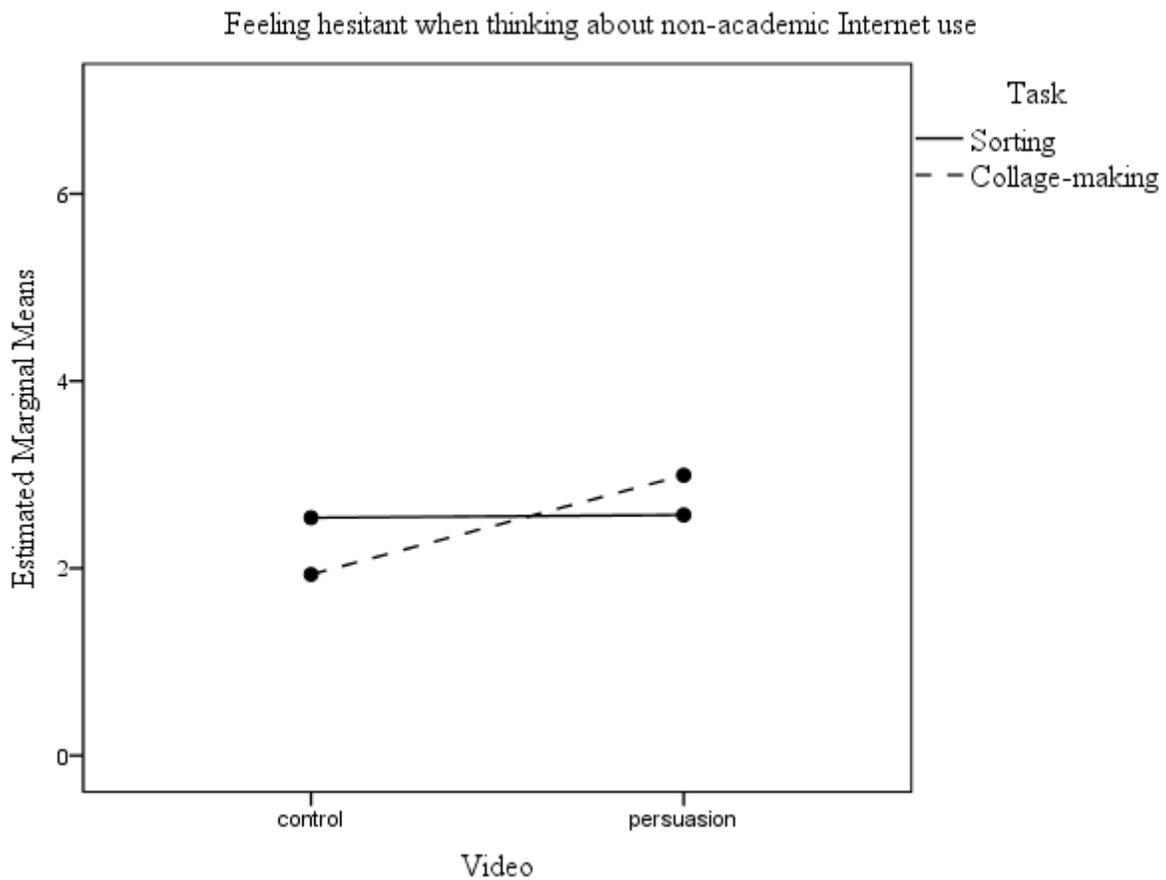
Note. This graph shows the marginally significant (*p* = .06) interaction effect for self-reports of hesitancy. Participants felt most hesitant after they had watched the persuasive video and created a collage.

Other analyses of covariance (ANCOVAs) entering GIAS scores as the covariate did not

yield any significant results. See Table 5.

Table 5

Non-Significant ANOVAs involving Internet Feelings

Emotion	df	F	p
Thrilled	(1, 95)	Video: .45 Task: 2.40 Interaction: .04	Video: .50 Task: .13 Interaction: .84
Exasperated	(1, 95)	Video: 1.38 Task: .63 Interaction: .02	Video: .24 Task: .43 Interaction: .88
Relaxed	(1, 95)	Video: .06 Task: .94 Interaction: .44	Video: .81 Task: .34 Interaction: .51
Worried	(1, 95)	Video: 2.14 Task: .16 Interaction: .13	Video: .15 Task: .69 Interaction: .72

Note. This table shows the non-significant ANOVA results.

Potential between-group differences in Internet Feelings were also analyzed by means of a series of paired *t*-tests. These paired *t*-tests compared participants' responses to the Internet Feelings measure made prior to treatment with their Internet Feelings responses made after treatment. Questionnaire items employing synonyms, such as "reluctant" prior to treatment and "hesitant" after treatment were directly compared.

Within the control Video/ sorting Task condition, a paired *t*-test showed a significant difference between the degree to which participants felt reluctant about non-academic Internet use before treatment and hesitant after the treatment ($t(24) = 2.09$, $p = .05$; $d- = .42$). Study participants in this condition felt less reluctant/hesitant after treatment ($M = 2.52$, $SD = 1.05$)

than before treatment (*M* = 3.96, *SD* = 3.39). Again within the control Video / sorting Task

condition, a paired *t*-test showed a significant difference between the degree to which

participants reported feeling positive about non-academic Internet use before treatment and

feeling favorable after treatment (*t*(24) = -2.16, *p* = .04; *d* = .43). Study participants in this

condition felt more positive/favorable after treatment (*M* = 4.72, *SD* = 1.65) than before

treatment (*M* = 3.96, *SD* = 1.77). Also within the control Video / sorting Task condition, a paired

t-test showed a significant difference between the degree to which participants reported feeling at

ease about non-academic Internet use before treatment and feeling relaxed after treatment (*t*(23)

= -3.01, *p* = .01; *d* = .61). Study participants in this condition felt more at ease/relaxed after

treatment (*M* = 4.75, *SD* = 1.73) than before treatment (*M* = 3.88, *SD* = 1.78). Again within the

control Video / sorting Task condition, a paired *t*-test showed a marginally significant difference

between the degree to which participants reported feeling eager about non-academic Internet use

before treatment and feeling willing after treatment (*t*(24) = -2.16, *p* = .07; *d* = .43). Participants

in this condition felt more eager/thrilled after treatment (*M* = 4.60, *SD* = 1.73) than before

treatment (*M* = 3.84, *SD* = 1.86). Additional paired *t*-tests comparing before and after Feelings

scores for the control Video / sorting Task condition failed to reveal any significant

differences. See Table 6.

      Within the persuasive Video / sorting Task condition, a paired *t*-test showed a significant

difference between the degree to which participants reported feeling at ease about non-academic

Internet use before treatment and feeling relaxed after treatment (*t*(23)= -2.19, *p* = .04; *d* = .45).

Participants in this condition felt more positive/favorable after treatment (*M* = 4.17, *SD* = 1.58)

than before treatment (*M* = 3.42, *SD* = 1.64). Additional paired *t*-tests comparing before and after

Feelings scores for the persuasive Video / sorting Task condition failed to show significant differences between Internet Feelings before and after treatment. See Table 7.

Within the persuasive Video / collage Task condition, a paired *t*-test showed a significant difference between the degree to which participants reported feeling uncomfortable before treatment and feeling uneasy after treatment ($t(23) = -3.19$, $p = .004$; $d = .65$). Participants in this condition felt more uncomfortable/uneasy after treatment ($M = 2.79$, $SD = 1.79$) than before treatment ($M = 1.67$, $SD = 1.79$). Additional paired *t*-tests comparing before and after Feelings scores for the persuasive Video / sorting Task condition failed to show significant differences between Internet Feelings before and after treatment. See Table 8.

Within the control Video / collage Task condition, a paired *t*-test showed a significant difference between the degree to which participants reported feeling excited before treatment and feeling thrilled after treatment ($t(23) = 2.33$, $p = .03$; $d = .48$). Participants in this condition felt less excited/thrilled after treatment ($M = 3.08$, $SD = 1.79$) than before treatment ($M = 3.71$, $SD = 1.83$). Additional paired *t*-tests comparing before and after Feelings scores for the control Video / collage Task condition failed to show significant differences between Internet Feelings before and after treatment. See Table 9.

Table 6

Non-Significant Paired t-Tests Within the control Video / sorting Task condition

Emotion	*df*	*t*	*p*
Uncomfortable/uneasy	24	1.74	.10
Excited/thrilled	24	1.42	.17
Frustrated/exasperated	24	1.58	.13

Note. This table shows the non-significant paired *t*-test results. Negative *t*'s indicate that participants reported feeling the specific emotion more after treatment than they did before treatment.

Table 7

Non-Significant Paired t-tests within the persuasive Video / sorting Task condition

Emotion	*df*	*t*	*p*
Uncomfortable/uneasy	24	-.81	.43
Excited/thrilled	24	.48	.64
Frustrated/exasperated	24	-.36	.72
Eager/willing	24	.00	1.0
Reluctant/hesitant	24	-.69	.50
At ease/relaxed	24	.36	.72
Concerned/worried	24	.52	.61

Note. This table shows the non-significant paired *t*-test results. Negative *t*'s indicate that participants reported feeling the specific emotion more after treatment than they did before treatment.

Table 8

Non-Significant Paired t-tests within the persuasive Video / collage task condition

Emotion	*df*	*t*	*p*
Excited/thrilled	23	.93	.36
Frustrated/exasperated	23	1.01	.32
Eager/willing	23	.77	.45
Reluctant/hesitant	23	-.60	.56
Positive/favorable	24	.83	.42
At ease/relaxed	23	-.43	.67
Concerned/worried	23	-.08	.94

Note. This table shows the non-significant paired *t*-test results. Negative *t*'s indicate that participants reported feeling the specific emotion more after treatment than they did before treatment.

Table 9

Non-Significant Paired t-tests within the control Video / collage Task condition

Emotion	*df*	*t*	*p*
Uncomfortable/uneasy	23	.77	.45
Frustrated/exasperated	23	1.04	.31
Eager/willing	22	1.35	.19
Reluctant/hesitant	23	1.19	.25
Positive/favorable	23	.93	.36
At ease/relaxed	23	.96	.35
Concerned/worried	23	.94	.36

Note. This table shows the non-significant paired *t*-test results. Negative *t*'s indicate that participants reported feeling the specific emotion more after treatment than they did before treatment.

To supplement these findings, a two-way analysis of covariance (ANCOVA) was run to determine whether the overall degree of affect intensity differed by condition. Overall affect intensity was operationalized as the sum of the Internet Feelings scores post treatment after the negative affect items had been reverse coded. Once the GIAS sum was covaried, there was found a significant main effect of Task ($F(1, 95) = 5.38$, $p = .02$; $d = .05$). People felt less positive affect when thinking about non-academic Internet use after making a collage ($M = 36.30$, $SD = 7.62$) than after sorting ($M = 38.94$, $SD = 7.95$). There was no main effect for Video ($F(1, 95) = 1.61$, $p = .21$), and no interaction effect ($F(1, 95) = .60$, $p = .44$).

Exploratory Analyses of Independent-Samples *t*-Tests with Pilot Study Data

One additional statistical approach taken to determine attitude change involved the

calculation of independent-samples *t*-tests comparing study participants' post treatment self-

reports of Internet Feelings to the Internet Feelings scores collected on another sample of

students who took part in the preliminary pilot study. Because pilot study participants were not

exposed to either the persuasive nor the control Video, this approach assumes that the data

collected in the pilot study (*n* = 20) represent baseline attitude levels against which experimental

study participant self-reports might be compared.

Overall, participants in the present investigation, which was conducted later in the

academic year than was the pilot study, had a greater awareness of non-academic Internet use

being a concern on campus than did participants in the pilot study. One-sample *t*-tests showed a

consistent trend across most experimental conditions. As compared to their peers in the pilot

study, experimental study participants were generally more aware of potential concerns related to

non-academic Internet use on campus. Participants in the control Video/ sorting Task had more

awareness (*M* = 3.56, *SD* = 1.76) than did participants in the pilot study (*M* = 2.15, *SD* = 1.27),

t(24) = 4.01, *p* = .001. Participants in the persuasive Video/ sorting Task also had more

awareness (*M* = 3.56, *SD* = 1.56), *t*(24) = 4.53, *p* < .001. The same was true for participants in

the persuasive Video/ collage Task condition (*M* = 4.00, *SD* = 1.35), *t*(24) = 6.83, *p* < .001. The

only one sample *t*-test which did not show a significant difference between experimental and

pilot study groups was a test focused on participants in the control Video/ collage Task

condition, *t*(24) = -1.28, *p* = .21. Given the possibility that these results might have been driven

by the fact that pilot study data were collected at the beginning of the school year before student

workloads and other stressors took effect, exploratory one-sample *t*-tests comparing mean scores

on each Internet Feeling measure earned by study participants post treatment were compared to sores earned by pilot participants were carried out.

No significant between-group differences were found for tests run to compare Internet Feelings scores earned by study participants in the control Video / sorting Task condition to scores earned by pilot study participants. See Table 10. Additionally, no significant between-group differences were found for tests run to compare Internet Feelings scores earned by participants in the persuasive Video / sorting Task condition to scores earned by pilot study participants. See Table 11.

Comparing scores earned by participants assigned to the persuasive Video / collage Task condition to scores earned by pilot study participants, an independent samples t-test revealed a significant between-group difference for scores on feeling thrilled when thinking about non-academic Internet use ($t(24) = 2.09$, $p = .05$, $d = .42$). Participants in this study condition felt significantly less thrilled after watching a persuasive video and making a collage ($M = 3.32$, $SD = 1.63$) than did participants in the pilot study ($M = 4.00$, $SD = 1.59$). Another independent samples t-test revealed a significant difference for participants in this condition and pilot study participants for scores on feeling willing when thinking about non-academic Internet use ($t(24) = -2.18$, $p = .04$; $d = .42$). Study participants in this condition felt significantly less willing to use the Internet after watching the persuasive video and making a collage ($M = 3.80$, $SD = 1.61$) than did participants in the pilot study ($M = 4.50$, $SD = 1.76$). Another independent samples t-test revealed significant between-group differences for scores on feeling hesitant when thinking about non-academic Internet use ($t(24) = 2.22$, $p = .04$; $d = .53$). Study participants in this condition felt significantly more hesitant after watching the persuasive video and making a collage ($M = 3.00$, $SD = 1.8$) than did participants in the pilot study ($M = 2.20$, $SD = 1.11$).

Another independent samples *t*-test revealed a significant difference for scores on feeling favorable when thinking about non-academic Internet use (*t*(24) = -2.74, *p* = .01; *d* = .53). Participants felt significantly less favorable after watching the persuasive video and making a collage (*M* = 3.80, *SD* = 1.74) than did participants in the pilot study (*M* = 4.75, *SD* = 1.83). Another independent samples *t*-test revealed a marginally significant difference between scores on feeling uneasy when thinking about non-academic Internet use (*t*(24) = 1.87, *p* = .07, *d* = .42). Participants felt more uneasy after watching a persuasive video and making a collage (*M* = 2.72, *SD* = 1.79) than did participants in the pilot study did (*M* = 2.05, *SD* = 1.36). An independent samples *t*-test also revealed a marginally significant difference between scores on feeling relaxed when thinking about non-academic Internet use (*t*(24) = -1.98, *p* = .06; *d* = .38). Participants felt less relaxed after watching the persuasive video and making a collage (*M* = 4.28, *SD* = 1.70) than did participants in the pilot study (*M* = 4.95, *SD* = 1.85). Additional independent samples *t*-tests failed to yield significant results. See Table 12.

Significant results were also found for independent samples *t*-tests comparing the pilot study data to scores earned by participants who watched the control video and made a collage. An independent samples *t*-test revealed a significant difference between scores on feeling thrilled when thinking about non-academic Internet use (*t*(24) = -2.51, *p* = .02; *d* = .54). Participants felt significantly less thrilled after watching the control video and making a collage (*M* = 3.08, *SD* = 1.79) than did participants in the pilot study (*M* = 4.00, *SD* = 1.59). Another independent samples *t*-test revealed a significant difference in feeling willing when thinking about non-academic Internet use (*t*(23) = -3.76, *p* = .001; *d* = .76). Participants felt significantly less willing after watching the control video and making a collage (*M* = 3.17, *SD* = 1.74) than did participants in the pilot study (*M* = 4.50, *SD* = 1.76). Another independent samples *t*-test revealed a significant

difference in scores on feeling favorable when thinking about non-academic Internet use ($t(23) =$ -3.63, $p = .001$; $d = .72$). Participants felt significantly less favorable after watching the control video and making a collage ($M = 3.46$, $SD = 1.74$) than did participants in the pilot study ($M = 4.75$, $SD = 1.83$). Another independent samples t-test revealed a significant difference in scores on feeling relaxed when thinking about non-academic Internet use ($t(23) = -2.34$, $p = .03$; $d = .49$). Participants felt significantly less relaxed after watching the control video and making a collage ($M = 4.04$, $SD = 1.89$) than did participants in the pilot study ($M = 4.95$, $SD = 1.85$). Additional independent samples t-tests failed to yield significant results. See Table 13.

Table 10

Non-significant independent samples t-tests, comparing Internet Feelings scores in the control video/ sorting task condition with pilot data

Emotion	df	t	p
Uneasy	24	.14	.89
Thrilled	24	-1.03	.32
Exasperated	24	.32	.75
Willing	24	.29	.78
Hesitant	24	1.53	.14
Favorable	24	-.09	.93
Relaxed	24	-.68	.50
Worried	24	-1.34	.19

Note. This table shows non-significant independent samples t-test results. Internet Feelings here are the Internet Feelings measures taken after the treatment. Negative t's indicate that participants in the experimental condition reported stronger feelings of the specific emotion than did participants did in the pilot study.

Table 11

Non-significant independent samples t-tests, comparing Internet Feelings scores in the persuasive video/ sorting task condition with pilot data

Emotion	df	t	p
Uneasy	24	1.69	.10
Thrilled	24	-.63	.53
Exasperated	24	.93	.36
Willing	24	-.98	.34
Hesitant	24	1.08	.29
Favorable	24	-1.61	.12
Relaxed	24	-1.62	.12
Worried	24	.63	.53

Note. This table shows non-significant independent samples *t*-test results. Internet Feelings here are the Internet Feelings measures taken after the treatment. Negative *t*'s indicate that participants in the experimental condition reported stronger feelings of the specific emotion than did participants did in the pilot study.

Table 12

Non-significant independent samples t-tests, comparing Internet Feelings scores in the persuasive video/ collage task condition with pilot data

Emotion	*df*	*t*	*p*
Exasperation	24	1.47	.15
Worried	24	.04	.97

Note. This table shows non-significant independent samples *t*-test results. Internet Feelings here are the Internet Feelings measures taken after the treatment. Negative *t*'s indicate that participants in the experimental condition reported stronger feelings of the specific emotion than did participants did in the pilot study.

Table 13

Non-significant independent samples t-tests, comparing Internet Feelings scores in the control video/ collage task condition with pilot data

Emotion	*df*	*t*	*p*
Uneasy	24	.38	.71
Exasperated	24	.60	.55
Hesitant	24	-1.36	.19
Worried	24	-.80	.43

Note. This table shows non-significant independent samples t-test results. Internet Feelings here are the Internet Feelings measures taken after the treatment. Negative *t*'s indicate that participants in the experimental condition reported stronger feelings of the specific emotion than did participants did in the pilot study.

Creativity Results

  Ratings of collages. Collages were rated for creativity using the Consensual Assessment Technique (CAT, Amabile 1982), as described in the introduction of this paper. Nine judges rated the collages for their creativity, technical goodness, and liking. All judges were students at the same college where the study had been conducted. All were interested in art and had enrolled in at least one art class in which they, themselves, produced art. The majority of judges spent approximately 40 minutes rating not only product creativity but also technical goodness and liking. According to the prevailing literature on the CAT, a reliability (Chronbach's alpha) figure of at least .70 is needed to demonstrate an appropriate level of agreement across judges (Hennessey, Kim, Guomin, & Weiwei, 2008). In this study, the Chronbach's alpha for the nine judges' ratings of creativity was .90. The Chronbach's alpha for the nine judges' ratings of likeability was .84. The Chronbach's alpha for the nine judges' ratings of technical goodness was .84. Taken together, these results indicate that the judges showed an appropriate, sometimes even an especially high, level of agreement. Such a finding contributes significantly to the existing research literature with the demonstration that products produced via an online collage-making program can be reliably assessed for creativity and related dimensions using the CAT.

  Theoretically speaking, it is always preferable for ratings of product creativity, technical goodness, and liking to be distinct, i.e. to not be highly correlated. The lack of a significant correlation between these rating dimensions would theoretically support the notion that judges were able to recognize and assess the creativity of a collage without being swayed by their liking for that product or by that product's degree of technical goodness. When the CAT was first developed and utilized, researchers were frequently successful in demonstrating the independence of ratings along these three dimensions (Hennessey et al., 2008). Importantly,

however, in recent years, the majority of research using the CAT to assess artistic products has

shown that these dimensions are, more often than not, highly positively correlated (Hennessey et

al., 2008). The exception to this rule seems to be that ratings of products tapping creative

performance in areas other than the arts tend to show only moderate (non-significant)

correlations between assessment dimensions (Amabile, 1996). In an effort to reconcile these

findings, Amabile (1996) postulates that it makes logical sense that the technical goodness,

likeability, and creativity of artistic products would be especially highly positively related

because each of these dimensions are determined in large part by a product's appropriateness

(Amabile, 1996; Hennessey et al., 2008). Indeed, this appeared to be the case for these nine

judges' ratings.

Ratings of collage creativity, technical goodness, and likeability were all positively and

significantly correlated with each other. Ratings for creativity and technical goodness were

correlated at .50 ($p<.001$); creativity and liking were correlated at .62 ($p < .001$); and technical

goodness and liking were correlated at .85 ($p < .001$).

Judges' ratings of creativity and participant experiences. Selecting out only those

study participants who had made a collage, correlations were run to determine whether judges'

ratings of product creativity were systematically related to participants' self-reports of their

experience creating the collage during the experiment, and to explore how the various aspects of

the participants' experience related to each other. More specifically, a series of Pearson-r

correlations were computed to assess the relation between judges' ratings of creativity and

participants' ratings of how engaged they were in the collage making, how hard they tried, how

creative they believed they were in the activity, and how proud they were of their collage. See

Table 14.

Table 14

Correlations between judges' ratings of creativity and participant responses

(N = 50)

Variables	1	2	3	4	5	6	7	8
	r	*r*	*r*	*r*	*r*	*r*	*r*	*r*
1 Judges' creativity rating	_	.09	.17	.37**	.28	.07	.11	.12
2 How engaged were you in the computer activity?	.09	_	.73**	.39**	.36*	.47**	.05	.28
3 How hard did you try in the computer activity?	.17	.74**	_	.69**	.66**	.49**	.06	.46**
4 How creative were you in your computer activity?	.37**	.39**	.69**	_	.84**	.50**	.16	.52**
5 How proud are you of your final product from the computer activity?	.28	.36*	.66**	.84**	_	.42**	.16	.65**
6 Would you repeat the computer activity in the future?	.07	.47**	.49**	.50**	.42**	_	-.17	.36*
7 How creative are you?	.11	.05	.06	.16	.16	.16	_	-.17
8 How much does your final product from the computer activity reflect your creative ability?	.12	.28	.46**	.52**	.65**	.36*	-.17	_

Note. This table shows the correlations computed for all participants who created a collage (both in the persuasive video condition and the control video condition).
** indicates *p* = .01. * indicates *p* = .05.

Within conditions which required participants to make a collage, correlations were also run to determine whether there was a systematic relation between study participants' attitude intensity, judges' ratings of the creativity of their collages, and participants' self-reports about their creative experience. A significant positive correlation emerged between study participants' post-treatment scores for total positive affect and self-reports of degree of task engagement ($r = .31$, $n = 50$, $p = .05$). Also significant and positive was the correlation between participants' scores for total intensity of Internet Feelings and self-reports of how hard they had tried at the collage-making task ($r = .30$, $n = 49$, $p = .05$). The positive correlations between how hard participants tried and total positive affect ($r = .27$, $n = 50$, $p = .06$), and between how proud participants were of their collage and total positive affect ($r = .25$, $n = 50$, $p = .08$) were marginally significant. No other correlations yielded significant results. See Table 15.

Table 15

Correlations between judges' ratings of creativity, participant creative experience, and affect intensity

(N = 50)

Internet Feelings Scores	Total Internet Feelings Score, post treatment	Total negative affect Internet Feelings Score, post treatment	Total positive affect Internet Feelings Score, post treatment
Creative Experience Manipulation Checks	*r*	*r*	*r*
Judges' creativity rating	-.10 *n* = 49	-.02	-.13
How engaged were you in the computer activity?	.28 *n* = 49	.10	.31*
How hard did you try in the computer activity?	.30* *n* = 49	.17	.27 *p* = .06
How creative were you in your computer activity?	.16 *n* = 49	.08	.16
How proud are you of your final product from the computer activity?	.27 *n* = 49	.13	.25 *p* = .08
Would you repeat the computer activity in the future?	.02 *n* = 49	-.01	.05
How much does your final product from the computer activity reflect your creative ability?	.09 *n* = 49	.09	.04

Note. * indicates *p* = .05. Marginally significant p-values are indicated in the body of the table.

Correlations Between Participant Internet Experiences

Correlations were run between the GIAS, IAT, and Internet Self-Efficacy Scale to further explore their relationship. See Table 16. The lack of correlations suggests that general attitudes toward non-academic Internet use, Internet addiction, and use of the Internet are independent constructs.

Table 16

Correlations between GIAS mean, IAT sum, and Internet Self-Efficacy

N = 100

Variables	GIAS	IAT	ISE
	r	r	r
GIAS	_	-.09	-.11
IAT	-.09	_	.12
ISE	-.11	.12	_

Note. This table shows correlations between various measures of participant Internet use/ Internet experience. The lack of significant correlations suggests that each construct is separate. Recall that participants were asked to think about non-academic Internet use when completing the GIAS.

Correlations Between Video Message Attitude, Affect, and Behavior Change

Two-way Analyses of Variance (ANOVAs) yielded no significant between-group differences for belief-based attitude change, as reported earlier. However, indices of belief-based attitude change were significantly correlated with participant awareness of non-academic Internet use being a concern on campus, and with scores for total affect, as calculated by the sum of all Internet Feelings measures taken after treatment with negative items recoded. See Table 17.

Table 17

Correlations Between Belief-Based Behavior Change, Video Message, and Affect

Variables	Non-academic Internet Use is a concern on campus.	Total affect
Outcome	*r*	*r*
Free up my time	.09 *n* = 98	-.12 *n* = 98
Allow me to develop normal relationships with friends	.11 *n* = 98	-.11 *n* = 98
Help me improve my academic achievement	.08 *n* = 98	-.14 *n* = 98
Reduce my stress	.21* *n* = 97	-.36** *n* = 97
Improve my mood	.23* *n* = 98	-.30** *n* = 98
Reduce my negative feelings	.18 *n* = 99	-.29** *n* = 99
Help improve my life	.26** *n* = 96	-.31** *n* = 96
Enable me to be a better person	.36** *n* = 98	-.19 *n* = 98
Enhance my effectiveness	.25* *n* = 99	-.09 *n* = 99
Make it easier to manage my life	.22* *n* = 99	-.19** *n* = 99

Note. This table shows correlations between measures on the Belief-Based Attitude Change Scale, study participants' agreement that non-academic Internet use is a concern on campus, and total affect scores. ** indicates that the correlation is significant at the .01 level. * indicates that the correlation is significant at the .05 level.

Discussion

The primary hypothesis guiding this investigation was that engagement in a creative activity can serve as an effective mechanism for attitude change. This proposition was guided by theory-driven work which has shown that audiences can be helped to take what is termed the central route to persuasion. The notion was that if people could be helped to actively process, internalize, and engage with the persuasive message they are hearing, then they would be far more likely to demonstrate deep-seated and prolonged attitude (and behavior) change (Bohner & Dickel, 2011; Chandler & Munday, 2016).

In this investigation, college students who were both exposed to a persuasive video regarding the potential dangers of non-academic Internet use and who were given the opportunity to create a collage incorporating elements of that video message were more likely than students who only watched the video or who only made a collage to internalize the video's overarching message. Yet, while students who watched the persuasive video and made a collage reported higher levels of endorsement of the video's overarching message than did any other design group, there was not a significant difference between their response and the response of the participants who viewed the persuasive video and who sorted images. And, as far as attitude change toward a specific outcome is concerned, it seems that making a collage without the opportunity to view a persuasive video could actually backfire when it comes to internalizing a cognitive component of attitude change.

Importantly, students who made a collage but who did not receive a persuasive message showed the lowest levels of awareness of campus-wide concerns related to non-academic Internet use of any of the four design groups. The creative process can be powerful; and, with great power comes great responsibility. If creative tasks are to be employed as part of an attempt

to change attitudes, it appears essential that the creativity task involved be constructed specifically to target persuasive information. It is too short-sighted to think that engagement in any sort of creativity-type task would be enough to alter attitudes. Careful manipulation is, indeed, essential.

In the present study, the creative process's contribution to attitude change appears to have been accomplished through affective channels. Students who created a collage were more likely to report feeling various types of negative affect when thinking about non-academic Internet use (e.g. feeling hesitant) than were students in the control condition. In fact, paired *t*-tests comparing participants' pre- and post-treatment self-reports of affect showed that sorting images, rather than making a collage, actually made participants feel more positively about non-academic Internet use (e.g. more favorable, more at ease). Study participants who made a collage, on the other hand, tended to become more negative. The fact that the opportunity to engage in a creative process prompted increases in negative affect is especially important, as affective response would be expected to have a significant effect on actual belief-based behavior change.

As outlined earlier, one possible explanation for why creative task engagement might be expected to augment the impact of a persuasive argument comes from the creativity literature and studies of the phenomenon of flow (e.g., Beard, 2015; Csikszentmihalyi, 1975). It is unlikely that flow occurred in this study. The necessary conditions needed for flow are many. Moreover, the flow state is very much person-specific. Flow is not something that everyone making a collage would be expected to experience. The incorporation of manipulation checks asking participants about how hard they tried at their task or how engaged they felt was designed to

capture information that might be indicative of the flow state, but results were, not surprisingly, inconclusive.

Another theoretical underpinning of this study was the idea that the creative process would help to fuel attitude change via the Elaboration Likelihood Construct. More specifically, the argument was that participants making a collage would be more willing and better able to elaborate on and engage with the persuasive message, and would, in turn, follow the central route to persuasion. Manipulation checks on participants' perceptions of video persuasiveness appeared to reveal that engagement in the creative collage-making task did not significantly impact participants' impressions of video persuasiveness. However, in hindsight, these study questions might have been phrased differently. Rather than asking participants how persuasive the video was, it would have been far better to ask how persuaded they were throughout the study session. Because participants were specifically asked how persuasive they found the *v*ideo to be, it is likely that any influence of task was forgotten or not called to mind, as participants zeroed in on their memory of just the video itself.

While study participants' attitudes and emotions both may have been significantly impacted by a combination of exposure to the persuasive message and the opportunity to engage with that message via a creative task, there were found no significant between-group differences for actual behavior change intentions. The only identified relationship between persuasion and behavior change came in the form of correlations with belief-based behavior change and affect. It was surprising that the video alone, a video specifically constructed to educate viewers about the potential dangers of non-academic Internet use, did not, in fact, persuade students to change their behavior or to seek resources.

The Internet Addiction Test (IAT) (Young, 1998) was administered at the very end of the study due to the concern that the completion of this measure itself might influence participants' views about non-academic Internet use. There is a pronounced negative valence to many of the IAT items. Despite the fact that this measure was completed post-treatment, there were no significant, or even marginally significant, effects of condition on scores. This null result supports the claim made by the creators of the IAT that it is an especially stable indicator.

Similar conclusions can also be drawn about the General Internet Attitudes Scale (GIAS) (Joyce, 2013). As outlined earlier, for the purposes of this investigation, the GIAS was initially intended to serve as a dependent measure. Upon further consideration, however, it was concluded that the high levels of stability / reliability associated with this inventory made it extremely unlikely that participants' scores were affected by their experimental treatment condition. Therefore, the decision was made to covary GIAS scores in an effort to control for individual differences in the attitudes participants presented with at the start of the study. While it is, of course, not recommended to use a measure that is administered post treatment as a covariate, the decision was made to make an exception to this rule.

A review of the literature indicates that this may be the first study of its type to employ an online collage-making task as the vehicle for study participants to engage in the creative process. While even the earliest applications of the Consensual Assessment Technique (CAT) (Amabile, 1982) frequently involved the judging of collages, those products were produced using actual cardboard, glue and colorful pieces of origami paper. Perhaps never before has the CAT been applied to virtual collages. Yet, inter-rater reliability analyses revealed that judges appeared to have very little difficulty rating these products. Judges' ratings were, in fact, found to be systematically related to study participants' own self-assessments of the degree of creativity they

believed they had displayed in their collages. Judges' ratings of collage creativity were not found

to be systematically related to various participant self-reports of creative experiences such as task

engagement, trying hard, and being proud of their final product. It should be noted here that

other studies of creative experience that have found connections between cognitive effort and

creativity (e.g. Roskes et al., 2014) did not use the CAT.

There were also no significant differences found between the creativity ratings given the

collages made by participants who viewed the persuasive video and participants who viewed the

control video. Importantly, however, the original hypothesis motivating this study was that it

would be *engagement* in the creative process and not demonstrated levels of creativity in a

finished product that would drive results. The focus here was on the potential for the creative

process to be transformative for creators. This emphasis of process over product is, in fact,

frequently echoed within the scholarly creativity literature. Something very special happens

when people are given the possibility of being creative. Here, that special something served to

impact attitude change. This process over product approach speaks to the currently popular

theoretical distinction made between levels of creativity (e.g. Kaufman & Beghetto, 2009).

Everyone assigned to the collage conditions was given the opportunity to be creative, and it was

that opportunity which engendered negative affect toward the attitude object. No collage created

as part of this study will spur a cultural transformation of the Big-C creativity kind. But Big-C

creative outcomes are not at all necessary for the transformational effect of the creative process

to take hold.

Several unexpected results relating to the experimental manipulation checks must also be

addressed. For example, it had been hypothesized that participants would report being more

engaged with the persuasive message when they had had the opportunity to explore the contents

of that message via the creative process. However, participants rated themselves as highly

engaged in both the creativity collage-making condition and in the photo sorting control

condition. These results appear to indicate that the majority of participants, across all conditions,

were highly engaged and interested in the experiment, and that is a good thing. Indeed,

participants rated themselves as trying very hard in both conditions. Pilot study results showed

that the sorting task was viewed as much more difficult than the collage-making task. As a result,

in the present investigation, the sorting task was modified to include fewer images than what had

been used the pilot study version. Still, it is possible that the control sorting task remained

especially challenging and, as a result, required greater engagement on the part of participants

than had been anticipated. Importantly, this unexpected finding that control / sorting task

participants were equally engaged as were collage task participants in no way negates the

possibility that it was engagement in a creative activity that drove study results. Engagement,

even deep levels of engagement, in a sorting activity must not be equated with creative

engagement.

      The original intention behind this study design was to compare the impact of engagement

in a creativity task with engagement in a task that offered no possibility of creativity. This initial

study was useful in showing the potential for creative task engagement to change the way in

which and perhaps the intensity with which individuals process a persuasive message. Future

investigations will need to more closely compare treatments requiring study participants to

engage in a creative process (and hopefully think about the contents of a persuasive message in

creative ways) with treatments that ask participants to think about that same persuasive message

in ways that do not involve creativity. It is possible that engagement in the sorting task gave

participants a sort of a break, an opportunity to detach from the difficult message they had just

heard about potential dangers associated with non-academic Internet use. A future study might do well to compare the impact of performing a creative task designed to facilitate engagement with the persuasive message with the impact of a more rote, memorization-type task also having to do with the content of the persuasive message. Future studies would also do well to compare the facilitative effects of creativity tasks tapping a variety of different kinds modalities-- verbal and figural tasks, for example.

Importantly, participants' ratings of video persuasiveness did not significantly differ across persuasive and control conditions. Taken at face value, this finding is problematic. However, a range of significant statistical findings do suggest that the persuasive video did its job and was sufficiently persuasive. This failure to find a significant between-group difference in participants' perceptions of the video they watched may well have stemmed from the fact that study respondents had no point of comparison, no second video presentation against which to compare the presentation they were being asked about. It is also noteworthy that the control video ended with the commentary, "Wired people should know something about wires. We should all know what physically connects us all." These words may have been more than enough to lead a participant in the control condition to rate this video as persuasive.

Attitudes are formulated and altered as a result of the confluence of cognitive, affective, and behavioral components. Taken together, the results of this study suggest that exposure to the persuasive video alone was enough to alter study participants' cognition surrounding non-academic Internet use, as demonstrated by a variety of statistically significant main effects of video exposure. The opportunity to make a collage was often sufficient to alter participants' affect towards the attitude object, as demonstrated by several paired t-test comparisons and one-sample t-test comparisons to pilot data, and by the main effect of Task on overall affect. In turn,

participants' affect was related to belief-based behavior change. The combined opportunity to view a persuasive video and to engage in a creativity task mirrors theoretical models arguing that attitudes are composed of cognitive, affective and behavioral components. The collage-making alone and video exposure alone were not enough. In order to encompass all three attitude components, a combination of persuasive video exposure and collage-making is required.

In light of the pervasiveness of excessive non-academic Internet use in this student sample, it would be interesting to explore in a future investigation the impact of a video message centered on a topic that is, perhaps, not as immediately relevant to participants. In designing the present investigation, the selection of an attitude change stimulus proved to be challenging. The overarching purpose of the study was not to investigate Internet use *per se*. Instead, non-academic Internet use was selected because it was thought to be relevant and interesting to college students and a useful vehicle to study attitude change. As the data show, Internet use was especially relevant to this sample.

The sheer number of study participants who screened for problematic degrees of Internet use, many at the level of what would be deemed Internet addiction, was unexpected and alarming, and warrants further research. Future studies at this academic institution and others like it should investigate just how prevalent problematic Internet use is on college campuses, along with the question of what kinds of interventions can increase student awareness and, potentially, stem this problem.

Importantly, results from this study indicate that issues of problematic Internet use must be considered as distinct from questions of frequency of Internet use, confidence in Internet use, or even general attitudes about the Internet. In the present study, the failure to find a significant relation between these constructs indicates that problematic Internet use, as measured by the

Internet Addiction Test, is a distinct construct, not to be confused with thoughtful or everyday

use of the Internet. However, as this study did not seek to fully explore or explain patterns of

Internet use on campus, it is important to note that the full impact of non-academic Internet use

cannot even begin to be understood based on the present results.

As discussed above, the bottom line, methodologically speaking, is that the persuasive

message presented in this study was especially relevant to and important for this college student

sample. The goal of this attitude change methodology was to persuade study participants to

consider the many ways in which excessive non-academic Internet use could be a problem,

convincing them that students should be mindful of such use, and pushing them towards the

conclusion that students should limit their non-academic Internet use. It is noteworthy that

exploratory analyses yielded the tentative finding that student awareness of the potential

problems associated with non-academic Internet use on campus increased across the academic

year. This finding makes good sense, as students just coming back to school after summer

vacation were perhaps not yet fully entrenched in campus culture.

Moving forward, it will be important for researchers exploring Internet use on campuses

to stay mindful of the fact that the Internet accrues countless benefits to students. "Non-academic

Internet use" is a fairly amorphous and broad concept. Despite the fact that the persuasive

message employed in this study emphasized this type of Internet use as being "problematic," it

would be a mistake make a value judgment about particular patterns of student Internet use

without first attempting to understand these patterns further. Indeed, using the Internet for non-

academic purposes, even excessively so, could have benefits for students such as helping them to

feel more connected to home via constant browsing of social media posts from friends and

family, staying informed of recent events, and coping with a competitive academic environment by detaching every now and again from the "real world."

Results showed that creative task engagement did, in fact, serve to influence participants' affect and emotions surrounding non-academic Internet use. Although more research will need to be done, the data demonstrate that the creative process has the potential to be successfully introduced into situations where attitude change is the goal. The incorporation of a creative task into the attitude change process can be seen to impact study participants' internalization of a persuasive message by influencing their affect towards an attitude object. This change in affect could, in turn, serve to more fully engage individuals in the persuasive message, making it more relevant and meaningful – as well as influence behavior change intention. Notably, when participants are asked to engage creatively only with their pre-existing knowledge of, ideas about and experience with an attitude object, creative task engagement might only strengthen their baseline attitudes, irrespective of whether those attitudes are well-founded. Only when individuals are presented with accurate, factual, and persuasive information and asked to engage creatively with that information can the creative task engagement be expected to facilitate attitude change. Clearly, the potential for engagement in the creative process to alter attitudes warrants further research. This study should be seen as a starting point for future investigations into the transformational possibilities of the creative process. One especially important possibility to consider will be the question of whether engagement in a creative task leads to attitude change via primarily affective, emotional channels. A second unrelated but equally important research agenda will be to further, and more precisely, explore students' non-academic Internet use on campus.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Amabile, T. M. (1982). The social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology 43*(5), 997–1013.

Amabile, T. M. (1996). *Creativity in Context.* Boulder, CO: Westview Press.

Andreasen, N.C. (2005). *The creating brain: The neuroscience of genius*. New York: Dana Press.

Baumann, N. (2012). Autotelic personality. In S. Engeser (Ed.), *Advances in flow research* (pp. 165-186). New York: Springer.

Beard, K. S. (2015). Theoretically speaking: An interview with Mihaly Csikszentmihalyi on flow theory development and its usefulness in addressing contemporary challenges in education. *Educational Psychology Review, 27*(2), 353-364.

Beghetto, R. A., & Kaufman, J. C. (2007). Toward a broader conception of creativity: A case for "mini-c" creativity. *Psychology of Aesthetics, Creativity, and the Arts, 1,* 13-79.

Bhattacherjee, A., & Sanford, C. (2006). Influence processes for information technology acceptance: an elaboration likelihood model. *MIS Quarterly, 30*(4), 805-825.

Bohner, G. & Dickel, N. (2011). Attitudes and attitude change. *Annual Review of Psychology, 62,* 391-417.

Byrne, C. A., & Arias, I. (2004). Predicting women's intentions to leave abusive relationships: An application of the theory of planned behavior. *Journal of Applied Social Psychology, 34*(12), 2586–2601.

Cacioppo, J. T., & Petty, R. E. (1984). The elaboration likelihood model of persuasion, *NA –*

    Advances in Consumer Research , 11, 673-675.

Chandler, D., & Munday, R. (2016). Elaboration likelihood model. In *A dictionary of media and*

    communication: Oxford University Press.

Chmielewski, T. L. (2012). Applying the elaboration likelihood model to voting. *The*

    International Journal of Inderdisciplinary Social Sciences, 6(10), 33-37.

Csikszentmihalyi, M. (1975). Beyond boredom and anxiety. San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1996). The flow of creativity. In M. Csikszentmihalyi (Auth), *Creativity:*

    Flow and the psychology of discovery and invention (pp. 107-126). New York:

    Harper/Collins.

Eysenck, H.J. (1965). Arthur Koestler. *The ANNALS of the American Academy of Political and*

    Social Science, 360(1), 198-199.

Gordon, W. (1961). *Synectics, the development of creative capacity*. New York: Collier Books.

Hennessey, B. A. (2015). If I were secretary of education: A focus on intrinsic motivation and

    creativity in the classroom. *Psychology of Aesthetics, Creativity and the Arts, 9,* 187-192.

Hennessey, B. A. (2013). Motivation is everything. In J. Jones & L. Flint (Eds), *The creative*

    imperative: School librarians and teachers cultivating curiosity together (pp. 85-95).

    Santa Barbara, CA: Libraries Unilimited.

Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology, 61,*

    569-598.

Hennessey, B.A., Amabile, T.M., & Mueller J.S. (2011). Consensual assessment. In M.A.

    Runco, & S.R. Pritzker (Eds.), *Encyclopedia of creativity (*2nd ed., Vol 1*) (pp. 253-260).*

    San Diego: Academic Press.

Hennessey, B. A., Kim, G., Guomin, Z., & Weiwei, S. (2008). A multi-cultural application of the consensual assessment technique. *The International Journal of Creativity & Problem Solving, 18*(2), 87-100.

Hennessey, B. A., Moran, S., Altringer B. A., Amabile, T.M., (2014). Extrinsic and intrinsic motivation. In P.C. Flood and Y. Freeney (Eds.), *Wiley encyclopedia of management, Volume 11: Organizational behavior.* John Wiley & Sons.

Hao, N., Ku, Y., Liu, M., Hu, Y., Bodner, M., Grabner, R. H., & Fink, A. (2016). Reflection enhances creativity: Beneficial effects of idea evaluation on idea generation. *Brain and Cognition,* 10330-10337.

Jackson, S. A., & Marsh, H. W. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. *Journal of Sport and Exercise Psychology, 18,* 17-35.

Jelenchick, L. A., Becker, T., & Moreno, M. A. (2012). Assessing the psychometric properties of the Internet Addiction Test (IAT) in US college students. *Psychiatry Research, 196,* 296-301.

Joyce, M. (2013). Development of a general internet attitude scale and internet self-efficacy scale. PhD Thesis, University College Cork.

Joyce, M., & Kirakowski, J. (2015). Measuring attitudes towards the Internet: The General Internet Attitude Scale. *International Journal of Human-Computer Interaction, 31*(8), 506-517.

Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The Four C Model of Creativity. *Review of General Psychology, 13,* 1-12.

Kaufman, J. C., & Beghetto, R. A. (2013). Do people recognize the four Cs? Examining

    layperson conceptions of creativity. *Psychology of Aesthetics, Creativity, and the*

    Arts, 7(3), 229-236.

Kaufman, J. C., Lee, J., Baer, J., & Lee, S. (2007). Captions, consistency, creativity, and the

    consensual assessment technique: New evidence of reliability. *Thinking Skills and*

    Creativity, 2(2), 96-106.

Koestler, A. (1964). *The act of creation*. London: Hutchinson & Co.

MacGregor, J. N., Ormerod, T. C, & Chronicle, E. P. (2001). Information processing and insight:

    a process model of performance on the nine dot and related problems. *Journal of*

    Experimental Psychology: Learning, Memory, and Cognition, 27, 176-201.

Merrotsy, P. (2013). A note on big-c creativity and little-c creativity. *Creativity Research*

    Journal, 25(4), 474-476.

Mirvis, P. H. (1996). Historical foundations of organization learning. *Journal of Organizational*

    Change Management, 9(1), 13-31.

Nolan, V. (2003). Whatever happened to Synectics? *Creativity and Innovation Management,*

    12(1). 24- *27.*

Petty, R.E., & Briñol, P. (2008). Persuasion: From single to multiple meta-cognitive processes.

    Perspectives on Psychological Science, 3, 137-147.

Petty R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument

    quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality*

    and Social Psychology, 46, 69-81.

Quinn, R. W. (2005). Flow in knowledge work: High performance experience in the design of

    national security technology. *Administrative Science Quarterly, 50*(4), 610-641.

Reed, P., Osborne, L. A., Romano, M., & Truzoli, R. (2015). Higher impulsivity after exposure to the internet for individuals with high but not low levels of self-reported problematic internet behaviours. *Computers in Human Behavior, 49,* 512-516.

Rogers, C. (1954). Toward a theory of creativity. *A Review of General Semantics, 11*(4), 250-258.

Roskes, M., De Dreu, C. W., & Nijstad, B. A. (2012). Necessity is the mother of invention: Avoidance motivation stimulates creativity through cognitive effort. *Journal of Personality and Social Psychology, 103*(2), 242-256.

Simonton, D. K. (1994). Greatness: Who makes history and why. New York, NY: Guilford Press.

Stein, M. I. (1953). Creativity and culture. *Journal of Psychology, 36*, 311–322.

Turel, O., Mouttapa, M., & Donato, E. (2015). Preventing problematic Internet use through video-based interventions: A theoretical model and empirical test. *Behaviour & Information Technology, 34*(4), 349-362.

Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist, 41,* 19–31.

Wallace, D. B., & Gruber, H. E. (1989). Creative people at work: Twelve cognitive case studies. New York: Oxford University Press.

Watson, S. L., Loizzo, J., Watson, W. R., Mueller, C., Lim, J., & Ertmer, P. A. (2016). Instructional design, facilitation, and perceived learning outcomes: An exploratory case study of a human trafficking MOOC for attitudinal change. *Educational Technology Research and Development, 64*(6), 1273-1300.

Weisberg, R. (1993). *Creativity: Beyond the myth of genius*. New York: W.H. Freeman.

Wolters, C. A., Denton, C. A., York, M. J., & Francis, D. J. (2014). Adolescents' motivation for

reading: group differences and relation to standardized achievement. *Reading and*

Writing, 27(3), 503-533.

Young, K.S. (1998). Internet addiction: The emergence of a new clinical disorder.

Cyberpsychology and Behavior, 1(3), 237-244.

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity:

The influence of psychological empowerment, intrinsic motivation, and creative process

engagement. *Academy of Management Journal, 53*(1), 107-128.

Appendix A

Examples of Collages

Low creativity

Medium creativity

High creativity