

**Flow and Productivity: A Pilot Study**

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**Abstract**

*Flow Theory* (Csikszentmihalyi, 1975) describes the phenomenon of the ‘*optimal experience*’; the experience in which individuals report feeling ‘*in the zone*’. When it was found that *flow* occurred more at work than in leisure (Csikszentmihalyi & LeFevre, 1989), the positive psychological benefits of flow seemed appropriate to apply to organizational environments. Although, individual differences play a large role in one’s likelihood of experiencing flow during a task (Csikszentmihalyi, 1975, Fullagar & Kalloway, 2009, Ullen, 2012). Creating a work-setting that successfully leads to flow for the majority of employees can prove to be complicated and this is perhaps why many organizations are not moving toward such implementations. Using a between-groups design, the current study investigated whether a flow-related cue would influence an individual to experience a flow-like state as opposed to an individual who only experienced a neutral cue. Further, if their experience with flow had any effect on their productivity, measured by number of sentences in response to a neutral essay topic. Flow-like symptoms were measured through the short FSS-2 (Jackson, 2008) and their written responses were analyzed using an online readability analyzer (Taylor, 2013). Participants also received the Autotelic Personality Questionnaire (Tse, 2018) and the Ten Item Personality Measure (TIPI) (Gosling, 2003). The manipulation did not yield any significance, although those who reported experiencing a flow-like state did write more sentences than those who did not experience a flow-like state. Significant correlations between flow and *extraversion* and *conscientiousness*, and *autotelic personalities* were also found.

*Keywords:* Psychology, flow theory, flow, Csikszentmihalyi, productivity, individual differences, Big Five, autotelic personality

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### **Introduction**

#### ***What is Flow Theory?***

Flow Theory is a product of positive psychologist Csikszentmihalyi (pronounced Chick-Sent-Me-High) and his exploration of happiness and creativity during the late 1970's. It was then that Csikszentmihalyi realized something through interview-based data collection. Although the activities in which people felt their deepest enjoyment may have varied greatly, whether it be painting, reading, or playing sports, the components of their reported experiences were strikingly similar. For example, interviewees described feelings of losing touch with themselves or losing touch with the rest of the world. Flow theory describes why a painter will spend weeks on end working on a particular painting, only to pay little attention to it once it is finished. It is this feeling of ecstasy and absorption in the task that makes everything beyond the task at hand melt away. The term *flow* was chosen because of the recurring reports in which individuals expressed feeling "carried away by an outside force, of moving effortlessly with a current of energy, at the moments of highest enjoyment" (Csikszentmihalyi, 2003, p. 39). Being that flow is considered to be the optimal experience, it is no wonder that researchers over the past few decades have turned their attention to flow theory.

#### ***What are the Elements of Flow?***

There are nine elements that Csikszentmihalyi has outlined as being necessary for the experience of flow. They are as follows: *challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, the transformation of time, and an autotelic experience* (Csikszentmihalyi, 1975). Csikszentmihalyi's interviews with rock-climbers from his early work help illustrate these

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elements: A rock-climber is between anxiety and boredom as they carefully climb to the summit. As long as they are pushing to challenge themselves within the realm of their skill, there is a balance. Here, their action and awareness can merge into one in which they are in a heightened state of awareness about their body and their position amongst the rocks. Within this awareness, there is no noise in their mind beyond the immediate task of making it to the next rock- their clear goal. Each move offers immediate and unambiguous feedback: *Did I fall? Did I slip? Am I mounted safely?* Here, the mind filters out unnecessary external stimuli to allow deep concentration on the task. The climber must feel in control of themselves and the environment in which they are climbing. Simultaneously, there will be a loss of self-consciousness. There is no consideration to one's identity- their name, their status, their past or future, only the task at hand. And in this moment, time transforms. Depending on the activity, the perception of time may seem to slow or speed up. Surgeon's report knowing the time to the minute, whereas climbers can lose track entirely. Lastly, one of the complicated elements of flow is the autotelic experience in which the activity must be intrinsically rewarding. It must satisfy an inner-goal for the individual, or there will be disinterest (Csikszentmihalyi, 2003). Without these elements, it is unlikely that flow can occur. These elements of flow allow for the experience of a seamless stream of control, concentration, and heightened mood (Csikszentmihalyi, 1975).

### ***What is Flow related to?***

#### ***Autotelic Personality***

While flow is an optimal experience that can be open to almost anyone, research has found that there is a personality type that invites the flow experience: *autotelic personality*. The term *autotelic* comes from the two Greek roots: *auto* (self) and *telos* (goal). An autotelic

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personality means someone has high intrinsic motivation towards relatively mundane tasks, they are willing to do it for the sake of doing it. Csikszentmihalyi regards those with an *autotelic personality* as those who “seem to enjoy situations that ordinary persons would find unbearable” (Csikszentmihalyi, 1990, p. 90). Illustrating the idea through anecdotal stories, Csikszentmihalyi describes Prison inmates or lost and isolated explorers. These individuals instinctively follow the elements of flow theory and find themselves turning dreadful situation into something they manage, can grow from, maybe even enjoy. This psychological resilience and curiosity for the sake of curiosity is a fundamental trend of *autotelic personalities* that is seen throughout research in flow theory. While an autotelic personality does seem to predict a higher likelihood of experiencing flow, Csikszentmihalyi asserts flow is not limited to those of an autotelic personality but that such a state of mind is possible to attain through mental exercise and discipline.

### ***Flow at Work***

Surprisingly, it was found that, for adults, engagement of the flow experience occurs more often in work settings than in leisure (Csikszentmihalyi & LeFevre, 1989). This means that individuals felt more positive feelings doing work-related tasks at their job, whether it be white-collar or blue-collar work, than at home watching TV. Additionally, flow was found to be an antecedent of pleasure and motivation for the activity in Japanese college students (Ishimura & Kodama, 2009), precursor for improved momentary mood (Fullagar & Kalloway, 2009), and that flow experiences at work can lead to declarative well-being (Ilies et al., 2016). In a 2004 study by Forbes and Domm, it was concluded that “a highly involved, intrinsically motivated, enjoyable mental state (flow) is a characteristic of creative and productive work” (Forbes &

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Domm, 2004, p. 10). These findings attest to the high potential that flow theory has in being applied to the work-place. Work is where individuals spend most of their days and offers a setting that can be manipulated to be flow-inducing, whether it be encouraging a balance of challenge and skill, omitting unnecessary interruptions, or providing unambiguous feedback.

### *The Challenges of Flow in the Workplace*

While the research shows flow to be a beneficial supplement for employee engagement, the implementation of flow theory in the workplace becomes complicated in practice. Flow is very subjective in nature and the elements of flow are very personal to the individual experiencing flow. A work environment that induces flow for one employee is not guaranteed to induce flow for another employee. For example, what is considered to be unambiguous feedback could vary and how to know what is a good balance of challenge and skill for an employee can be difficult for management. Despite flow's promising potential in the workplace, it is likely this difficulty in generalizability of flow that most organizations have not made a move towards more flow-inducing job designs.

### *Introduction to current study: How little is too little?*

The current study is designed to understand if a flow-related cue influence an individual into experiencing a flow-like state. Further, how minimal can the flow-related cue be to induce a flow-like state? Lastly, does being in a flow-like state have any effect on productivity, measured by number of sentences in response to a neutral essay-topic. This study uses a minor flow (versus non-flow) manipulation by showing participants via random assignment conditions either a short five-minute video about flow and its benefits or a five-minute video on an unrelated topic. By manipulating whether participants watched a flow-related video or a non-related video, it could

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be concluded whether the priming of a flow-related video was the facilitator of the flow-like state and heightened productivity, a characteristic of flow. In addition, this study included questionnaires across conditions that gauge if certain individual traits such as an autotelic personality or the components of the Big Five (openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability) to see if certain traits are predictive of experiencing a flow-like state or heightened productivity.

### **Method**

#### ***Participants***

The sample for this study consisted of 213 individuals and all entries were anonymous. For taking this study, SUNY New Paltz students were able to receive one credit towards their Research Experience Component, a required 12 half-hour credits worth of various research activities for psychology undergraduates, so it is believed that the sample is representative of primarily SUNY New Paltz college students. Participants aged in range from 19 years old to 50 years old, with an average age of 24.97 ( $SD = 6.68$ ). The sample consisted of 20.7% males ( $N=44$ ), 77.5% females ( $N=165$ ), and 1.9% non-binary ( $N=4$ ).

#### ***Materials***

Using the computer software Qualtrics, this study included a between-groups design in which participants were randomly assigned to watch one of two videos. The video activity was done immediately after completing demographic questions such as age, year in school and gender, the Autotelic Personality Questionnaire (Tse, 2018) and the Ten Item Personality Measure (TIPI) (Gosling, 2003) which both assess personality traits. There, participants were instructed to rate how strongly they disagree or agree with the statement presented on a scale of

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1-7. Afterward, participants received one of the two videos via random assignment. One video was a neutral video explaining Schrödinger's Cat and is considered the control. Schrödinger's Cat is a paradox thought-experiment from the 1930's, and this topic was chosen to serve as a control topic to the other video, the experimental condition. The other video was considered to be the minimal cue for flow, an educational introduction to flow and what it means to “*get in flow.*” Both videos were approximately five minutes long. Regardless of which video participants watched, participants were then instructed to respond to a neutral essay-topic, encouraging them to write as little or as much as they would like as long as they complete the task fully. The essay question asked, “How can people best be encouraged to make healthier lifestyle choices?” The survey was finalized with the short FSS-2 (Jackson, 2008), which assessed whether the individual experienced flow.

### ***Procedure***

The procedure for this study included an initial online briefing. This briefing included a short summary of what to expect from the study such as a series of questions, a five-minute video, and writing a short essay which in total would take up to thirty minutes. It was then recommended that participants complete the study on a computer due to the video and essay-writing, but it was not required. Later on, participants were instructed to indicate whether they were on a computer, tablet with a physical keyboard, or tablet/iPhone with no physical keyboard. Finally, the briefing expressed that any information provided is confidential and taking the survey was entirely optional. Participants were instructed to email the primary researcher with any questions or concerns regarding the study.

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In analyzing the collected data, the first step was analyzing the written responses to the essay question. This analysis was done using the Readability Analyzer tool, an online software tool used in a previous study analyzing the complexity and readability of participants written responses (Geher et. al, 2015). The tool “estimates the readability of a passage of text using the Flesch Reading Ease, Fog Scale Level, Flesch-Kincaid Grade Level, and other metrics” (Taylor, 2013). This readability analyzer gave passage statistics such as number of sentences, words per sentences, characters per word and percentage of difficult words. Additionally, it gave readability scores such as the Dale-Chall score. The website remarked this score as “one of the most accurate readability metrics” as it incorporated a list of 3,000 easy words which were understood by 80% of fourth-grade students, then computed a score based on how many words present in the passage are not in the list of easy words. This description means that passages with a higher score indicates a more complex level of reading, as it contains fewer of the 3,000 easy words than a passage with a lower score.

### **Results**

Two independent samples t-test were conducted. The first was between the experimental condition, whether the participant received the control video about Schrödinger's Cat and the experimental video about flow, and the readability scales (Flesch Reading Ease, Gunning Fog Scale Level, Flesch-Kincaid Grade Level, SMOG Grade, and Dale-Chall score). The second was between the experimental condition and the flow mean, assessed by a participant's average score on the short FSS-2 scale (Jackson, 2008).

Two basic correlational analyses were conducted. The first was between the flow mean and the components of the Big Five: *openness, conscientiousness, extraversion, agreeableness*

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*and emotional stability*. The second was between the autotelic average score drawn from the Autotelic Personality Questionnaire (Tse, 2018) and the components of the Big Five listed above.

The first independent samples t-test between the experimental condition and readability scores resulted in a significance for the Dale-Chall score,  $t(204) = 1.99, p = .048$ . Higher scores of the Dale-Chall indicate higher level of readability, for example a score of 9.0-9.9 indicates the passage is at a college level of readability. Those in the control group who watched a video about Schrödinger's Cat had a mean score of 7.89 ( $SD = 1.59$ ) whereas those who watched the video about flow had a mean score of 7.44 ( $SD = 1.73$ ), (See Table 1). With these means, both conditions wrote within a 9-10th grade level; however, those who watched the neutral video (the control condition) wrote at a more complex level of readability than those who watched the flow video (the experimental condition). The second independent samples t-test analyzed whether those who watched the flow video ( $M = 4.86, SD = 1.14$ ) or if those who watched the control video ( $M = 4.86, SD = .96$ ) went into flow. The results found no significance,  $t(210) = .031, p = .975$ , (See Table 1). It appears that which video the participants watched had no effect on whether or not they went into flow and that those who watched the control video wrote at a more complex reading level. Those who watched the flow video wrote more simplistically, although each condition was within the range of a 9th-10th grade reading level.

While this study did not imply that the video participants were exposed to had any statistical impact on whether they experienced flow, the correlational analyses that were conducted offered insight into how individual differences can impact the experience of flow. A correlational analysis between flow mean and individual differences found a p value of

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approximately .000 for extraversion,  $r(213) = .247, p > .000$ , conscientiousness,  $r(213) = .268, p > .000$ , and autotelic personality,  $r(213) = .398, p > .000$ , (See Table 2). Meaning that those who did experience flow during their time taking the study were strongly related to those who reported being high in extraversion, conscientiousness, and autotelic personality traits. When the autotelic personality mean was correlated with the components of the Big Five, each relationship was significantly correlated, meaning that individuals with strong autotelic personality traits are likely to be extraverted,  $r(213) = .154, p = .025$ , agreeable  $r(213) = .185, p = .007$ , conscientious,  $r(213) = .391, p > .000$ , emotionally stable  $r(213) = .445, p > .000$ , and open to new experiences  $r(213) = .315, p > .000$ . (See Table 2).

When the flow mean and reliability scales were analyzed, a significant correlation between average flow score and number of sentences was found,  $r(213) = .203, p < .003$ . This finding implies that those who did experience flow, regardless of experimental condition, wrote responses with a significantly higher number of sentences than those who did not experience flow. This result supports the hypothesis that those who are experiencing flow are likely to write more than those who are not experiencing flow.

### Discussion

The current study investigated the effect a flow-related cue would have on an individual experiencing a flow-like state and if this state of flow had any effect on productivity, operationalized by number of sentences written in response to a neutral essay prompt. Additionally, the study gathered information about dispositional traits to better understand the relationship between individual differences and flow. This study specifically chose to use a very minimal flow-related cue to help reflect the difficulty that organizations face when trying to

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adjust their work-environment to be more flow inducing. It is not always possible to change everything about the environment, so how little is too little for an environment or task to induce flow for an individual? The study found that the manipulation of which video (flow versus non-flow) participants were exposed to had no effect on if they experienced flow or if they wrote more. The study did find that those who reported being flow, regardless of condition, wrote more sentences than those who did not report being in flow. Regarding the Dale-Chall score, it can be concluded that those in flow wrote more simplistically and more sentences than those in the control condition. Additionally, this study found that those who rated high in autotelic personality traits were related to being high on all of the Big Five components. As for those who rated high for being in flow, they were related to those being high in extraversion, conscientiousness and autotelic personality.

While this study was unable to reject the null hypothesis in stating that those who watched the control video and those who watched the experimental video would not score differently on a series of analyses, this study has aided in researchers having a better understanding of how little is too little for a flow-related cue induced flow for an individual. To reference the significant correlations between individual personality differences and flow mean, an individual's inclination towards flow is likely to be a result of their personality disposition. This study is a helpful contribution to positive psychological and industrial literature as it has reasserted the correlation between flow and heightened productivity and the important role that individual differences play when it comes to experiencing flow.

**So What?**

While this study has shown that the educational flow video may have been too covert to have any significant effect, I encourage researchers to continue exploring the dimensions a flow-related cue must have to be significantly impactful. By having a better understanding of how minimal or simplistic the flow-related cue must be to still induce flow would give organizations insight into what effect their efforts towards a flow-inducing work-environment could have on their employees. Flow literature suggests that the perception of work being dreadful and unfulfilling may play a part in the idea that work is void of autonomy so if workers changed their negative attitudes toward work, they could have a more fulfilling and perhaps even optimal experience (Csikszentmihalyi & LeFevre, 1989). This finding about workers' perceptions and understandings of their work suggests that perhaps mere education on flow and its effects could have a lasting impact on individuals.

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### Tables

**Table 1:** Independent Samples T-Test between Experimental Condition, Dale-Chall score and flow mean.

Variable	M (SD)	t (df)	p
Flow Mean	Control: 4.86 (.96) Flow: 4.86 (1.14)	.031(210)	.975
Dale-Chall Score	Control: 7.89 (1.50) Flow: 7.44 (1.73)	1.99(204)	.048

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**Table 2:** Basic Correlational Analysis between Autotelic Personality Mean, Big Five, Flow and Number of Sentences.

	Flow Mean	Extraversion Mean	Agreeableness Mean	Conscientiousness Mean	Emotional Stab Mean	Openness Mean	# of Sentences
Autotelic Personality Mean	.398** .000 213	.154* .025 213	.185* .007 213	.391* .000 213	.445** .000 213	.315* * .000 213	-.018 .792 206
Flow Mean	1	.247** .000 212	.103 .134 212	.268** .000 212	.134 .052 212	.072 .298 212	.203** .003 206

\*\* . Correlation is significant at the .01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).