



# Mind Pad

Canada's student written, edited,  
and published psychology newsletter.

# Notes d'idées

Le bulletin rédigé, édité et publié par les étudiants  
de la Société canadienne de la psychologie.

SPRING 2016 – PRINTEMPS 2016





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Le bulletin rédigé, édité et publié par les étudiants  
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*Mind Pad* has two mandated goals:

1. It aims to provide a professional newsletter that is written and reviewed by students of psychology who are affiliates of the Canadian Psychological Association. The content of the newsletter should be of interest to all who are practicing and studying psychology, but the primary audience of the newsletter is students of psychology.
2. It aims to offer studying psychology researchers and writers an opportunity to experience a formal submission process, including submission, review, and resubmission from the points of view of both submitter and reviewer/editor.

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Le mandat de *Notes d'idées* a deux objectifs :

1. Fournir un bulletin professionnel rédigé et évalué par les étudiants en psychologie qui sont membres affiliés de la Société canadienne de psychologie. Le contenu devrait être d'intérêt à tous les praticiens et étudiants en psychologie, mais les étudiants en psychologie sont les lecteurs cibles.
2. Fournir aux étudiants en psychologie l'opportunité de connaître le processus formel de soumission y compris la soumission, la révision, et la resoumission du point de vue d'auteur et d'évaluateur/redacteur.

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## Table of contents

### 3 Disordered Eating among Female Athletes: A Review of Potential Sports-related Predictors

Veerpal Bambrah, B.Sc. (Hons.), University of Toronto

### 8 A Report on the Youth Mental Health Day Symposium: Exploring the Impact of Research on Policy and Society

Wanda Truong, M.Sc., University of Calgary

### 11 The Relationship between Gender, Stress, and Conscientiousness in University Students

Chantal, M. T. LeBlanc, B.A. (Hons.), Acadia University

### 16 Defining Treatment Responders and Non-Responders in CBT

Talia Hashmani, University of Waterloo

### 21 The Influence of Vocally Expressed Emotions on Attitude Change

Joshua J. Guyer, M.Sc., Queen's University

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# Disordered Eating among Female Athletes: A Review of Potential Sports-related Predictors

Veerpal Bambah, B.Sc. (Hons.), University of Toronto

## Abstract

The prevalence of disordered eating (DE) ranges from 0-21% in the general population and from 0-62% in female athletes. The wide prevalence range in the latter group is due to the inconsistent criteria for defining DE and the lack of standardized assessment tools. Given the severity and prevalence of DE and eating disorders (EDs) in female athletes and the amount of time and effort athletes dedicate to their sport, it is critical to identify the sports-related predictors of such pathology within this population, in order to prevent the onset of symptoms and the progression of the disease to its clinical phase. Accordingly, there are two objectives for this paper. First, a literature review will demonstrate that coach-athlete conflict, coaching style, and athletes' desires to be leaner to improve sports performance are specific sport-related predictors of DE. Second, prevention strategies and future research regarding this behaviour in athletes will be discussed.

## Résumé

La prévalence de l'alimentation désordonnée varie de 0 % à 21 % dans la population générale et de 0 % à 62 % chez les athlètes féminines. L'étendue élevée de la prévalence dans le dernier groupe est due à l'absence de critères uniformes pour définir les troubles de l'alimentation et d'outils d'évaluation normalisés. Compte tenu de la gravité et de la prévalence de l'alimentation désordonnée et des troubles de l'alimentation chez les athlètes féminines, et le temps et les efforts que les athlètes consacrent à leur sport, il est essentiel de cerner les prédicteurs liés au sport propres à cette pathologie dans cette population particulière, afin de prévenir l'apparition des symptômes et la progression de la maladie jusqu'à sa phase clinique. Le présent article comporte deux volets. Tout d'abord, une revue de la littérature montrera que les conflits entre athlète et entraîneur, le style d'entraînement et le désir de l'athlète d'être plus mince pour

améliorer ses performances sportives sont des prédicteurs liés au sport de l'alimentation désordonnée. Deuxièmement, les stratégies de prévention et la recherche future sur ce comportement chez les athlètes seront examinées.



Despite increased female involvement in sports, most studies agree that female athletes are at risk for eating disorder (ED) onset (Smolak, Murnen, & Ruble, 2000). EDs (i.e., binge-eating disorder, bulimia nervosa [BN], anorexia nervosa [AN], and EDs not otherwise specified) involve significant apprehensions with food, body-weight, and shape that cause abnormal eating behaviours (e.g., starvation, overeating, purging; Nattiv et al., 2007). To diagnose EDs, clinicians must find specific diagnostic criteria in patients, such as weekly binge-eating episodes and subsequent compensatory behaviours for BN, and morbid fears of obesity and unwillingness to maintain a healthy weight for AN (American Psychiatric Association, 2013). Occasionally, individuals with disordered eating (DE)—characterized by abnormal eating behaviours—do not meet all of the criteria for an ED diagnosis. Consequently, there are more individuals who exhibit pathological eating behaviours than are clinically diagnosed.

In defining what DE entails, Nattiv and colleagues (2007) suggest a behaviour continuum, which starts with healthy dieting but could proceed to more excessive weight/dietary restrictions, passive or active dehydration (e.g., saunas, etc.), and end at the onset of a clinical-level ED. Commonly, DE behaviours are accepted as a nonclinical concept and originate from self-report scales, such as the Eating Disorders Inventory (Garner, Olmstead, & Polivy, 1983), Eating Disorders Examination (Fairburn & Cooper, 1993), and Eating Attitudes Test (Bonci et al., 2008; Garner, Olmstead, Bohr, & Garfinkel, 1982). The prevalence of DE ranges from 0-21% in the general population and 0-

62% in female athletes (Coelho, Soares, & Ribeiro, 2010). The wide range for the latter group is due to inconsistent criteria for defining DE and the lack of standardized assessment tools for this population (Bonci et al., 2008). Regarding clinical-level ED diagnoses—the end of the behaviour continuum—the lifetime prevalence of BN and AN in female athletes range from 1.1% to 4.2% and 0.5% to 3.7%, respectively (Sundgot-Borgen, 1994).

A specific subset of disorder eating behaviours is found among female athletes. *Anorexia athletica*, a dangerous eating behaviour found in this particular population, entails restriction of nutrient consumption, energy intake, and body mass, as well as excessive and compulsive exercise, despite high physical performance (Sudi et al., 2004). *Anorexia athletica* is not recognized as a mental disorder in medical manuals, such as the International Statistical Classification of Diseases and Related Health Problems and the Diagnostic and Statistical Manual of Mental Disorders. Accordingly, because *anorexia athletica* does not include all of the diagnosable criteria for AN, it is referred to as DE or subclinical ED (Sudi et al., 2004). DE is also part of the *female athlete triad* (FAT), which includes amenorrhea (i.e., abnormal absence of menstruation) and bone demineralization (i.e., bone mineral sparsity). Together, DE, amenorrhea, and bone demineralization can harm sports performance and long-term health through the manifestations of severe clinical pathologies, such as EDs, functional hypothalamic amenorrhea, and osteoporosis (Nattiv et al., 2007). Furthermore, a more expanded and contemporary view of the FAT, which also includes endothelial dysfunction, cardiovascular risk, and gastrointestinal-renal problems, further demonstrates the detrimental impact of DE among female athletes (Lanser, Zach, & Hoch, 2011; Wheatley, Khan, Székely, Naughton, & Petróczi, 2012).

Given the severity and prevalence of DE in female athletes, it is critical to identify the predictors of such pathology within this high-risk population. Moreover, given the large amount of time and effort that athletes dedicate to their respective sport (e.g., trainings, practices, etc.), it is especially important to identify sports-related predictors of DE, in order to prevent the onset of symptoms and the progression of the disease to its clinical phase. Many ED correlates have been suggested (Sundgot-Borgen, 1994); however, in classifying correlates as predictors, a causal relationship must be demonstrated (Kazdin, Kraemer, Kessler, Kupfer, & Offors, 1997). Because cross-sectional investigations only quantify the association be-

tween the exposure of a variable and an outcome, these studies are susceptible to the reverse causality phenomenon and disqualify causal interpretation.

The literature review conducted in the current article led to the identification of only a small number of prospective research studies that establish sports-related predictors of DE among female athletes. Nevertheless, this paper will highlight coach-athlete conflict, coaching style, and athletes' desires to be leaner to improve performance as sports-related predictors of DE. As a result of the review findings, future research directions and prevention strategies will be discussed.

## Review Findings

### Coach-Athlete Conflict and Coaching Style

The coach-athlete relationship contributes to athlete motivation and performance (Mageau & Vallerand, 2003). This interpersonal dynamic is also suggested to be predictive of eating psychopathology. Shanmugam, Jowett, and Meyer (2014) examined the predictive role of interpersonal difficulties between an athlete and their parents, coach, and teammates on eating psychopathology among 122 adult competitive athletes, 70% being female. Athletes represented individual and team sports, had been competing in their respective sport for an average of 8 years, trained with their coach for an average 3 years, and spent almost 6 hours with them weekly. Global ED psychopathology (including restraint, eating/shape/weight concerns) was assessed at baseline and after six months. Only perceived interpersonal conflict with the coach predicted athletes' eating psychopathology, with higher levels of conflict predicting more severe eating attitudes and tendencies six months later.

Although Biesecker and Martz (1999) also investigated the coach-athlete dynamic, they specifically examined the impact of coaching style on vulnerability to EDs among females and males. Participants with a coach who was performance-centered and weight-preoccupied (i.e., focused on how the athlete's weight gain could affect their performance and the team score) exhibited higher instances of dieting, body-image anxiety, and fears of being fat than students with a coach who was person-centered, supportive, and caring (i.e., concerned about how the athlete views their weight gain and how it affects their life). Females reacted more pathologically than males in both conditions. However, a methodological limitation to this research was it employed university students pretending to be athletes with a coach. Analog research cannot determine if the students were react-



ing like actual athletes. Nevertheless, the findings suggest that performance-centered and body-weight preoccupied coaching style increases vulnerability for body image and eating problems in females and males.

Consequently, the limited findings suggest that coach-athlete conflict and coaching styles preoccupied with competitiveness and team scores may be predictors of EDs among female athletes. Accordingly, awareness of the negative role these sports-related factors play in eating psychopathology should be increased.

### **Desires to Maximize Sports Performance**

Athletes are often surrounded by myths about body-weight and performance. One myth among female athletes is that the minimum body-weight and body fat must be attained to maximize sports performance (Nattiv et al., 2007). However, muscle is denser than fat and occupies less space in our bodies; thus, the less muscle an athlete has, the weaker he/she gets, which decreases performance (Nattiv et al., 2007).

Martinsen and Sundgot-Borgen (2013) found that the prevalence of an ED was higher among elite adolescent female athletes compared to male athletes, and to nonathletic males and females. Notably, 72.7% of the diagnosed female athletes reported the desire to be leaner, and therefore dieted to enhance their performance. The cross-sectional nature of the study, however, precludes causal interpretation between desires of leanness and an ED diagnosis.

Despite these findings by Martisen and Sundgot-Borgen and the myth pertaining to body-weight and performance, Loucks (2004) suggests that low body-weight and/or a low fat-muscle ratio is indeed crucial for successful performance in particular sports (e.g., sports involving weight-classes, opposing gravitation, aesthetic and endurance sports). Accordingly, these athletes are at greater risk for ED development. Krentz and Warschburger (2013) examined predictors for DE levels—after one year—in athletes involved in aesthetic sports (i.e., gymnastics, ice figure-skating, diving, ballet, roller-skate figure-skating). Within a sample of 38 female and 27 male adolescent athletes, there was a decrease in DE among males one year later, while the stability of DE was high among females at both assessment points. Additionally, the desire to be leaner to improve sports performance

was the only sports-related variable that predicted changes in DE a year later. A cross-lagged partial correlation analysis<sup>1</sup> revealed that greater desires to be leaner to improve sports performance at time 1 predicted higher levels of DE at time 2, and not vice versa. However, given that only German adolescent athletes from aesthetic sports were assessed, the findings regarding the longitudinal development of DE in athletes are limited to this ethnic- and sports-group.

Thus, athletes' desires to achieve leanness to improve sports performance are predictive of DE. This leanness is generally mirrored in successful adult athletes in the sport. However, puberty in adolescent female athletes involves significant changes in body size, proportion, and composition (Malina, Bouchard, & Bar-Or, 1994). One-third of the weight gain is fat tissue, and therefore, adolescent females may prevent these changes through maladaptive eating behaviours (Bonci et al., 2008). Moreover, among athletes who start a specific sport at a young age, there is a chance of choosing a sport that becomes incompatible with the athlete's developing body type at adolescence and puberty, which may influence perceptions of self-appearance and performance (Bratland-Sanda & Sundgot-Borgen, 2013). In turn, this may cause athletes to engage in DE behaviours to attain leanness and enhance performance. Krentz and Warschburger (2013) found that age differences in athletes at time 1 did not predict DE one year later. However, the follow-up period of one year may not have been sufficient enough to capture change in DE due to age differences in participants.

### **Limitations and Future Research**

Although a small body of literature exists in this area, it is not without methodological shortcomings that limit the validity and reliability of the above findings. First, when examining predictors of EDs in female athletes, research should focus on the actual athletes' perspectives and their specific pressures. Collegiate and professional athletes are unique because they have a continuous mentor, their coach, who evaluates and motivates them on a frequent basis (Biesecker & Martz, 1999). Analog research—such as that by Biesecker and Martz—cannot determine if research participants are reacting like real athletes.

Secondly, although validated self-report question-

<sup>1</sup> A criterion for causality is whether the partial correlation between the independent variable at time 1 and the dependent variable at time 2 under the condition of the resolved dependent variable at time 1 is significantly larger than vice versa (Krentz & Warschburger, 2013).

naires were used to identify eating psychopathology in the reviewed studies, athletes may not report pathological eating patterns because they fear being excluded from their team. Accordingly, future studies can avoid biased responses through the use of implicit behavioural tasks (e.g., lexical decision-making task, Go/No-go task, etc.), since anonymity alone may not deter athletes from responding in socially desirable ways for researchers.

Thirdly, with regard to the effects of coach-athlete conflict and coaching style on eating psychopathology, future research should also assess the varied impact of coaches' gender, given that the samples in the reviewed studies included only male coaches (Biesecker & Martz, 1999) or predominantly male coaches (85%; Shanmugam et al., 2014). Finally, while the present review was restricted to sports-related factors and did not consider personality and psychological (i.e., emotional, cognitive, etc.) factors as predictors of DE, these factors should be considered in future research.

### Prevention and Educational Initiatives

Education among athletes and coaching-staff about sports-related risk factors, high-risk groups, and early identification strategies is suggested for ED prevention. This literature review suggests that coaches and female athletes should be educated on the importance of a relationship with social support and proactive problem-solving skills for interpersonal conflict. Additionally, coaches should know the impact of their attitudes about an athlete's weight gain on the athlete's eating behaviours and attitudes. This awareness could help the coach and other sports professionals who work closely with the athlete on a regular basis (e.g., sports psychologists) help the athlete understand weight-gain or improve strength and compete in a higher weight-class, for example. Another target should be athletes who manipulate their eating behaviours and body-weight with the belief that it will enhance performance. Educational initiatives should thereby highlight the associated health risks of such tendencies. Additionally, these initiatives should start as early as 9–11 years of age, given the risk that puberty may have on maladaptive eating behaviours (Sundgot-Borgen et al., 2013).

Consequently, the development and implementation of educational programs that promote self-acceptance, healthy eating, and balanced training and rest could be effective in ED prevention. However, research that demonstrates the effectiveness of an educational program in reducing ED development is

lacking. Accordingly, studies trying to identify predictors of EDs in female athletes and examine the effectiveness of educational programs should build upon the limitations of the studies reviewed. Ideally, to clarify the causality of these factors, future investigations would replicate the reviewed studies' findings using experimental designs with large sample sizes (Jacobi, Hayward, de Zmann, Kraemer, & Agras, 2004). As well, longitudinal studies that take into consideration, and aim to prevent, attrition are needed.

When examining the effectiveness of educational programs for ED prevention, it is important to consider that the specific pressures faced by athletes vary by the ethnic background of the athletes (Okano et al., 2005) and by the nature of the sport itself (Thompson & Sherman, 2010). Additionally, the effectiveness of such programs in minimizing ED cases should be evaluated with longitudinal studies that exceed one year, in order to sufficiently examine any impact of age in ED development and any long-lasting impact of preventative initiatives (Sundgot-Borgen et al., 2013). Consequently, much work remains in developing our understanding of the risk factors for EDs in female athletes, and in turn, developing effective preventative programs.

### Conclusion

Eating psychopathologies are common among female athletes. Coach-athlete conflict, coaching style, and athletes' desires to be leaner to improve sports performance are sports-related predictors of DE in athletes. Athletes, coaches, and health professionals should be educated on these predictors, the high-risk groups, and identifying these problems effectively. Finally, since research demonstrating the success of an educational program in reducing ED development is lacking, future studies trying to identify ED predictors in athletes and examine the effectiveness of preventative educational programs should build upon the methodological limitations of the reviewed studies.



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# A Report on the Youth Mental Health Day Symposium: Exploring the Impact of Research on Policy and Society

Wanda Truong, M.Sc., University of Calgary

## Abstract

This article provides a brief report of the Second Annual Youth Mental Health Day, a one-day symposium presented by the Mathison Centre for Mental Health Research & Education at the University of Calgary. The theme of the symposium, adolescent cannabis use and psychosis, fits the Mathison Centre's goals to advance research on the early identification, treatment and prevention of mental disorders. Invited speakers included internationally renowned researchers, Dr. Steven Laviolette, Dr. Yasmin Hurd, and Sir Robin Murray. From the perspective of a student affiliate, the day's events are recapped, with an emphasis on insights learned regarding the impact of research on policy and society.

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## Résumé

Le présent article est un bref compte rendu sur la deuxième journée annuelle sur la santé mentale des jeunes, un symposium d'une journée présenté par le Mathison Center for Mental Health Research & Education de l'Université de Calgary. Le thème du symposium – la consommation de cannabis chez les adolescents et la psychose – cadre avec les objectifs du Mathison Centre, qui consistent à faire progresser la recherche sur le dépistage précoce, le traitement et la prévention des troubles mentaux. Des conférenciers de renommée internationale, dont le Dr Steven Laviolette, la Dre Yasmin Hurd et Sir Robin Murray, étaient présents. Du point de vue des étudiants affiliés, les activités de la journée sont résumées, et s'articulent autour des connaissances apprises en ce qui concerne les répercussions de la recherche sur les politiques et la société.

## Introduction

The Mathison Centre for Mental Health Research and Education at the University of Calgary hosted its Second Annual Youth Mental Health day on March 25, 2015. The one-day symposium drew the interest of 140 students, researchers, and mental health clinicians of varying disciplines. From the perspective of a student affiliate, the events of the day are recapped, with an emphasis on insights learned regarding the impact of research on policy and society.

In the spirit of the Mathison Centre's mandate to advance research on the early identification, treatment, and prevention of mental disorders, the theme of the day focused on the effects of cannabis use in adolescence. Specifically, symposium participants explored the link between cannabis exposure in adolescence and mental health outcomes, such as substance abuse, anxiety, and psychosis. Cannabis sativa, the Latin term for the plant, is also widely known as marijuana. Despite growing public health debates about the safety and legal status of cannabis, and increasing rates of cannabis use amongst adolescents, the symposium showcased research to help further our basic understanding of the effects of cannabis on neurodevelopment. Internationally renowned researchers, Dr. Steven Laviolette (Western University), Dr. Yasmin Hurd (Mount Sinai), and Sir Robin Murray (King's College London), were invited to share in the findings from their laboratories investigating the effects of cannabis on adolescent brain development and behaviour. The day ended with a panel discussion, which invited speakers and participants to reflect on societal implications of the science.

## Cannabis use amongst adolescents

In Canada, 23.65% of adolescents report having experimented with cannabis and 10.02% use it regularly (Sznitman, Kolobov, Ter Bogt, Kuntsche, Walsh, & Harel-Fisch, 2015). The use of cannabis currently





surpasses cigarette smoking in the adolescent population (Knight, Sherritt, Shrier, Harris, & Chang, 2002). This mainstream adoption of cannabis by adolescents is driven by shifts in the attitudes towards cigarette smoking and increasing knowledge of its harmful effects on health (Sznitman et al, 2015). In contrast to cigarette use, cannabis is viewed as a natural substance, which is perceived by adolescents to be less harmful (Sznitman et al, 2015). Although research on early cannabis exposure on the mammalian endocannabinoid system is still in its infancy, research being conducted by Dr. Laviolette and Dr. Hurd is showing results suggesting that (contrary to common belief) there may be harms associated with cannabis. Thus, a central aim of the symposium was to address the assumption that cannabis use among adolescents is benign.

Studying cannabis exposure in animals allows researchers to control for many factors, including the dose and chemical composition of cannabis. As noted by all of the speakers, the composition of cannabis found today is drastically different from what it was decades ago (Murray, Laviolette, & Hurd, 2015). Central to Dr. Laviolette's research is distinguishing the specific effects of tetrahydrocannabinol (THC) and cannabidiol (CBD), both of which are found in cannabis plants in varying proportions. THC is the psychoactive ingredient in cannabis that produces rewarding effects, and Dr. Hurd's team demonstrated that it also increases sensitivity to other drugs of abuse. On the other hand, CBD may have the opposite effect – decreasing sensitization effects and their associated behaviours, while having therapeutic effects on anxiety. Given these opposing findings, it is unsurprising that society's understanding of cannabis is polarized. However, it is this level of nuance that is needed to clarify an evidence-informed approach to cannabis use.

### **Adolescence as a period of increased risk for mental health problems**

It is estimated that 14% of children ages 4 to 17 years are living with a mental illness in Canada (Waddell, McEwan, Shepherd, Offord, & Hua, 2005). Moreover, childhood mental illness increases the relative risk of experiencing a mental illness in adolescence, which further increases the relative risk in adulthood (Smetanin, Stiff, Adair, Ahmad, & Khan, 2011). Adolescence may represent a window of opportunity in which to focus prevention efforts of this public health issue, as it is a period of rapid growth and plasticity (Paus, Keshavan, & Giedd, 2008). Indeed, in light of

the many neural and behavioural changes that characterize this period, adolescents may be particularly amenable to psychosocial interventions, such as education and modifications to the environment. Targeting prevention at early stages is another way to identify individuals at high risk. Dr. Lisa Buchy, a post-doctoral fellow studying with Dr. Jean Addington, presented research underway at the Mathison Centre on clinical high-risk youth. Using neuroimaging to identify neural factors that may mediate the link between cannabis use and conversion to psychosis, Dr. Buchy found that abnormal patterns of brain connections in youth with a younger age of onset of cannabis use were predictive of development of psychosis.

As aforementioned, adolescence is itself a period of increased risk for mental health problems (Paus et al, 2008). Recent work done by Dr. Hurd demonstrates that adolescent exposure to THC may have further downstream effects, increasing risk for substance abuse in offspring who were never exposed to cannabis. These intriguing cross-generational effects may arise through epigenetic, or environmental, alterations of the genome that give rise to alterations in molecular and behavioural expressions of drug sensitization (Szutorisz et al, 2014). The keynote address given by Sir Robin Murray from King's College London described research on psychosis development from a population perspective to identify social and environmental risk factors for psychosis. Dr. Murray conducted epidemiological work in the 1980's and 1990's, which uncovered the association between cannabis use and schizophrenia. These findings were ground breaking as they were in contrast to the prevailing medical view of schizophrenia. Rather, Dr. Murray's work showed that schizophrenia is associated with social determinants and its expression may be modifiable by the environment. His most recent research focuses on specifying vulnerable populations by studying the interactions between genetic variants and psychological traits. For example, their work showed that individuals higher on schizotypy, a personality trait that is thought to lie on the schizophrenia spectrum, have an increased risk of psychosis following cannabis exposure (Colizzi et al, 2015).

### **Conclusion: Youth mental health and public policy implications**

To end the day of lively and stimulating talks, speakers were gathered to take part in a panel discussion to address the issue of cannabis use on youth mental health. The speakers were invited to answer the following questions, (1) what implications does

the research data have on public policy, and (2) what advice would you give to adolescents regarding cannabis use? The speakers stressed the importance of the distinction between legalization versus decriminalization with regards to policy. The question of legalization is a question of safety that can be addressed with basic research on the neural and behavioural effects of THC and CBD. Decriminalization of cannabis, on the other hand, is a question that is ultimately influenced by how society views cannabis and the social implications surrounding its use. Another problem that was highlighted is that consumers are unaware of the potency, or chemical composition, of the cannabis that they are receiving. In addition, the speakers noted that there are known chemical differences in cannabis used in North America compared to the UK and continental Europe, making it difficult to generalize the results of studies across different countries (Murray et al, 2015). Thus, a future challenge will be for researchers to conduct both well controlled, yet ecologically valid, studies examining the specific short and long-term effects of THC and CBD.

Regarding advice to be given to adolescents, there was a consensus that abstinence-only approaches do not work. According to Dr. Murray, simply telling adolescents that cannabis is bad will likely result in a polarization of opinions. For example, claiming that cannabis will lead to negative outcomes, like psychosis or addiction, can lead adolescents to believe the opposite. That is, that cannabis is innocuous if they do not experience an immediate adverse effect. However, given Dr. Murray and Dr. Buchy's work examining age of onset of cannabis use on the developing brain, perhaps a recommendation resulting from this research would indicate targeting even younger adolescents (i.e., pre-teens) with educational interventions to inform them of these unique risks of cannabis use during this sensitive period. As we learned from the talks, research shows the effects of cannabis use are complex, with genetics and personality characteristics interacting with environmental exposure. A key future direction of research is aimed at further elucidating these effects to predict risk profiles, which will require analysis on the population-level. Thus, rather than promoting the message that cannabis is wrong, a more balanced, harm reduction, approach is needed to educate adolescents on the potential risks. Indeed, the take home message of the day was that there is still a need for basic and clinical research to inform evidence-based public policy decisions, and to educate the public on the nuances and

specificities of the risks of cannabis use in adolescents. More data on risk factors may help to prevent the development of mental health issues in adolescents as cannabis exposure may be a modifiable risk factor that can be addressed by public health efforts.



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# The Relationship between Gender, Stress, and Conscientiousness in University Students

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## Abstract

Previous studies have negatively associated conscientiousness and stress. Although causation has not been established, research has found that high conscientiousness is related to low stress. The present study investigated if the relationship between stress and conscientiousness remained consistent across genders and to what extent males and females differ. Acadia University students ( $N = 80$ ) completed questionnaires assessing levels of conscientiousness and perceived stress. Once data were collected they were separated according to gender in order to compare the differences. A Pearson's product moment correlation coefficient was calculated for each gender. A negative correlation was found for men,  $r(38) = -.528$ ,  $p < 0.001$  and women,  $r(38) = -.423$ ,  $p = 0.003$ . Men and women did not differ in their levels of conscientiousness ( $p = 0.253$ ).

## Résumé

Dans les études effectuées à ce jour, conscienciosité et stress sont associés négativement. Bien qu'aucun lien de causalité n'ait été établi, la recherche a constaté qu'un niveau élevé de conscienciosité est lié à un faible niveau de stress. La présente étude cherche à savoir si la relation entre stress et conscienciosité est la même chez les deux sexes et dans quelle mesure les hommes et les femmes diffèrent à ce chapitre. Des étudiants de l'Université Acadia ( $N = 80$ ) ont rempli un questionnaire visant à évaluer le degré de conscienciosité et le stress ressenti. Une fois recueillies, les données ont été réparties selon le sexe afin de dégager les différences. Un coefficient de corrélation de Pearson a été calculé pour chaque sexe. Une corrélation négative a été constatée chez les hommes,  $r(38) = -.528$ ,  $p < 0,001$ , et chez les femmes,  $r(38) = -.423$ ,  $p = 0,003$ . Les hommes et les femmes ne sont pas différents pour ce qui est du degré de conscienciosité ( $p = 0,253$ ).

Past literature has shown that high levels of stress are associated with greater psychological symptoms, such as anxiety, anger, and depression (Bartley & Roesch, 2010; O'Connor, Conner, Jones, McMillan, & Ferguson, 2009). Specific personality constructs have shown to serve as a protective factor against stress. For example, Barley and Rosech (2011) examined the relationship between conscientiousness and stress, they found that highly conscientious individuals were predisposed to use better coping strategies in stressful situations and suggest that conscientiousness and stress are negatively related. Conscientiousness is characterized as a tendency to be well organized, diligent, thorough, achievement oriented, reliable, and self-determined (John & Srivastava, 1999). High levels of conscientiousness have also been related to greater perceived health, life satisfaction, and positive affect (Hayes & Joseph, 2003). It could be said that people with high conscientiousness cope better with stress, thus living healthier lives. In addition, individuals high on conscientiousness show elevated levels of self-regulation, persistence, and impulse control (John & Srivastava, 1999). Given the significant relationship between conscientiousness and stress, it is important to further focus on aspects that may moderate this connection, such as gender.

Bartley and Roesch (2010) have established that conscientiousness impacts how one appraises and responds to stressful situations. Stress can be defined as any situation that is appraised as threatening (Murphy, Miller, & Wrosch, 2013). According to Murphy and colleagues, a person's reactivity to stress may be context dependent. In other words, feeling as though one has control over a situation and being highly conscientious might result in decreased reactivity to the stress (Murphy et al., 2013). However, that was not the case. Murphy et al. conducted a longitudinal study using women who were at high risk for developing depression. Highly conscientious women did not report less stressful episodes, but they perceived them as less severe than women who were low in conscientiousness.



Researchers have focused on how participants cope with stress and have shown that men and women use different coping styles and that compared to men, women suffer more stress. Higher conscientiousness is related to an increase in stress tolerance and better stress management which predicts better physical and mental health outcomes (O'Connor, Conner, Jones, McMillan, & Ferguson, 2009; Gartland, O'Connor, Lawton, & Ferguson, 2014). Low-conscientious individuals are thought to experience higher levels of stress because they implement less beneficial coping strategies compared to highly conscientious individuals. Moreover, if sub-optimal coping strategies are used, individual may have more stress in turn leading to a higher probability of developing physical or mental illnesses. Research by Vollrath and Torgersen (2000) found that neuroticism and conscientiousness had entirely opposite effects on coping preferences under stressful conditions. While neuroticism was associated with ineffective use of coping strategies, Vollrath and Torgersen suggested that conscientiousness was strongly related to problem-focused coping.

Many previous studies have already concluded that there is a concrete relationship between the personality trait, conscientiousness, and level of stress experienced. Murphy et al. (2013) stated that, for health, the one personality trait that was particularly important in buffering against morbidity was conscientiousness. Conscientiousness has also been linked to longevity (Kern & Friedman, 2008). Moreover, highly conscientious individuals tend to have better eating habits and consume less high-fat foods (O'Connor et al., 2009). Conscientiousness had the capacity to moderate stress-related changes in health behaviours such that individuals low in conscientiousness responded more negatively to stressful encounters compared to highly conscientious individuals. This could be explained through the association of positive affect and highly conscientious individuals (Bartley & Roesch, 2011).

Particular personality traits evolve differently among males and females because of gender-based social experiences and biological differences (Vecchione, Alessandri, Bardaranelli, & Caprara, 2012). This may suggest that the relationship between conscientiousness and stress may vary by gender; however, this relationship has not been investigated. Researchers have shown that females score higher on measures of conscientiousness compared to men. However, higher observed inter-individual variability has been reported among females (Vecchione et al., 2012). A contributing factor to gender differences in

relation to conscientiousness and stress may be that situational contexts impact males' and females' conscientious behaviours.

Investigating the ways in which men and women are similar or different offer several benefits. For example, being aware of gender differences allows for a better understanding of the human species. However, it is important to consider whether gender differences are purely biological in nature or if differences arose over time due to social aspect. An interesting study conducted by Vianello, Schnabel, Sriram, & Nosek (2013) tested males and females implicitly and explicitly on a variety of personality traits. Gender differences for conscientiousness were much smaller when tested implicitly, thus suggesting that gender differences were largely influenced by gender stereotypes (Vianello et al., 2013). With that in mind, it is possible for conscientious behaviours to manifest themselves differently across genders. Perhaps males tend to exhibit more conscientiousness at work, while females show more conscientious behaviour at home with the family.

All of the previously mentioned studies have focused on the relationship between conscientiousness and stress. Individuals high on conscientiousness tended to have lower levels of stress; building from these findings, in the present study we examine gender differences relative to these constructs. With that in mind, Spector and Zhou (2014) have found that gender is a moderating factor between personality and stressors in counterproductive work behaviour. We hypothesize that males and females will both have a negative relationship between conscientiousness and stress and suspect that gender will moderate this relationship.

## Method

### Participants

Young adults between the ages of 17 and 22 years were pooled from the Acadia University student population. Quota sampling was used. The sample ( $N = 80$ ) consisted of 40 males, 40 females. Students who took part in the study were volunteers and received no compensation for their participation.

### Materials

Conscientiousness was assessed using a 20-item measure from the International Personality Item Pool (IPIP; Goldberg, et al., 2006). Similar to the NEO-PI-R personality inventory, the IPIP is highly correlated with the NEO-PI-R personality inventory ( $r = .80$ ) and has shown to be a highly reliable measure ( $\alpha = 0.90$ ) (Goldberg, et al., 2006). The 20-item measure con-



sisted of 10 negatively scored items (i.e., “I waste my time”) and 10 positively scored items (i.e., “I am always prepared”). Participants rated each statement on a five-point rating scale (from 1 = very inaccurate to 5 = very accurate). A 10-item Perceived Stress Scale (PSS; Cohen, Karmarck, & Mermelstein, 1983) was used to assess stress during the last month. The scale contained four positively stated items (“how often have you felt that you were on top of things?”) and six negatively stated items (“how often have you been upset because of something that happened unexpectedly?”). The PPS required participants to rate each question on a five-point rating scale (from 1 = never to 5 = very often).

### Procedure

Data were collected over two separate occasions. Surveys were administered to any students who wished to participate. An equal portion of males and females were sought to participate in the study. The researcher kept track of participants’ gender to ensure an equal number of male and female participants were recruited. Those who wished to participate were given consent forms to be certain they were aware of potential risks and that their information would be kept confidential. Once signed, the consent forms were put inside an envelope to ensure anonymity. The survey was handed out to participants and they had approximately 10 minutes to complete the survey. No verbal instructions were given as the survey contained all the necessary information. However, a researcher remained present in the event that participants had questions. Once the survey had been completed, it was collected and placed in an envelope corresponding to the gender specified. Debriefing forms were distributed to participants to read. The form contained information regarding any scales used, the purpose of the study, and thanked participants for their time. After the form had been read, participants were given the opportunity to ask questions and were provided with contact information if they had any further questions or concerns regarding the study.

### Results

In the current study, a Pearson product-moment correlation coefficient was calculated using SPSS to test the relationships between gender, conscientiousness, and stress. Pearson’s  $r$  helped determine which gender had the strongest linear relationship between conscientiousness and stress. No responses were excluded and each participant responded to all questions. A negative correlation was found for men,  $r(38) =$

$-.528$ ,  $p < 0.001$  and women,  $r(38) = -.423$ ,  $p = 0.003$ . That is to say, individuals with a low perceived stress score scored higher on conscientiousness and vice versa. Scatterplots were made for both males and females, as shown in *Figure 1* and *Figure 2*. Males had a stronger association with conscientiousness and stress. To test for significance, correlations were turned into z-scores then put into a z-difference equation and compared with a z-critical value. Fisher’s  $r$ -to- $z$  transformation test of difference between two independent correlation coefficients was not significant ( $z = p = 0.253$ ).

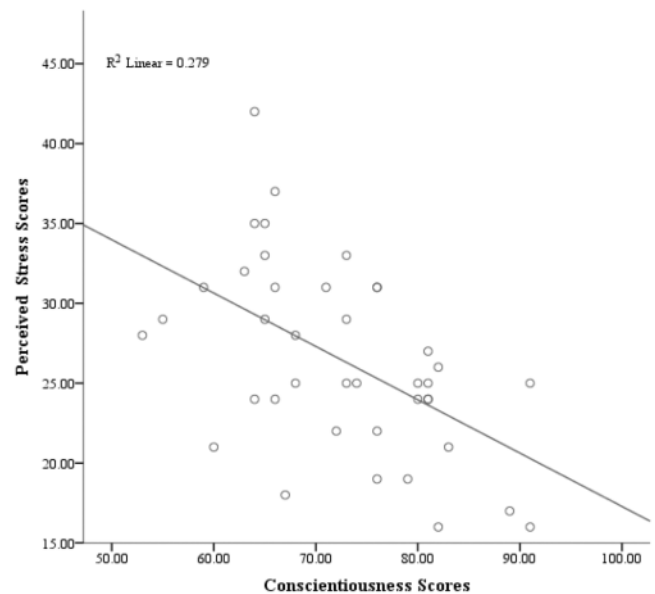


Figure 1. Relationship between perceived stress scores and conscientiousness scores for men.

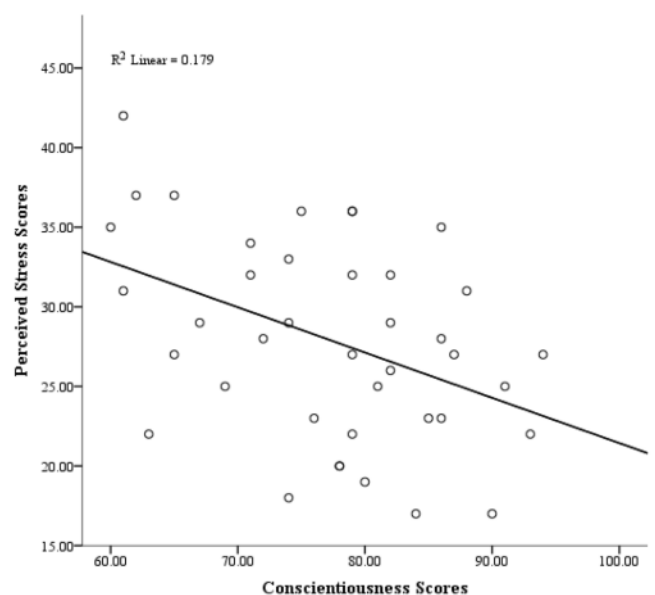


Figure 2. Relationship between perceived stress scores and conscientiousness scores for women.

An independent t-test ( $N = 80$ ) was also conducted to compare whether males and females differed on their mean perceived stress scores and conscientiousness scores. Results revealed men ( $M = 26.48$ ,  $SD = 5.94$ ) and women ( $M = 27.93$ ,  $SD = 6.30$ ) did not significantly differ between their mean perceived stress scores,  $t(78) = -1.059$ ,  $p = .293$ . However, women ( $M = 77.20$ ,  $SD = 9.35$ ) were found to be significantly more conscientious than men ( $M = 72.48$ ,  $SD = 9.40$ ),  $t(78) = -2.254$ ,  $p = .027$ . Although these analyses do not directly address the hypothesis (i.e., the relationship between stress and conscientiousness did not significantly differ across gender), these results are consistent with past research and further confirm that males and females differ on conscientiousness.

## Discussion

The initial hypothesis was not supported; no significant differences were found between men and women relative to conscientiousness and stress. Consistent with past literature, women, on average, were found to be more conscientious than men (Vianello, Schnabel, Sriram, & Nosek, 2013). Gender biases may explain the results found in the current study as women are often presented as being more careful, responsible and diligent.

The current findings have some limitations. A large downfall of using questionnaires is that participants are asked to self-report which makes for less accurate findings. Also, social desirability biases may have influenced participants' responses. If the study had been conducted implicitly in which participants were not aware of what was being measured the results may have turned out differently. The type of individuals sampled (i.e., university students), may have contributed to insignificant findings as men and women are thought to be under the same amount of academic stress. A more controlled study using a broader population would be better suited to address the research question.

Although no significant differences were found, further research is needed to explore if there is an interaction between gender, conscientiousness and stress. It has already been established that highly conscientious individuals have better coping skills resulting in lower stress (Bartley & Roesch, 2011). However, a suggestion for future research could take highly conscientious men and women and observe whether they employ different coping strategies in stressful situations. It may be possible that only certain facets of conscientiousness or the perceived stress scale (PSS)

are influenced by gender. Examining different facets of conscientiousness and the PSS in isolation may reveal underlying gender differences.

Elaborating on the difference found between men and women on the construct of conscientiousness, previous literature has established that conscientiousness is related to longevity (O'Connor, Conner, Jones, McMillan, & Ferguson, 2009; Gartland, O'Connor & Lawton, 2012). Could this relationship partly explain why women live longer? Stress is perceived as less threatening to highly conscientious individuals resulting in more positive affect and less distress (Bartley & Roesch, 2011). The relationship between conscientiousness and stress is important, teaching individuals to incorporate conscientious behaviours in their daily lives could potentially reduce stress.



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# Defining Treatment Responders and Non-Responders in CBT

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## Abstract

Although the literature provides evidence that cognitive behavioural therapy (CBT) is an effective first-line treatment for many psychological disorders, there are a substantial amount of failed cases. Current literature overlooks the large proportion of individuals who do not respond to treatment and focuses on those who make credible gains due to CBT. How do clinicians know if someone has truly responded to CBT? Unfortunately, clinicians do not have a standardized global method to define responder status to treatment. Rather, each clinician uses an individualized measure, lacking consistency across the field. Due to the knowledge gap in this field, this literature review aims to address several ways of defining treatment response while highlighting the lack of a standard method. In order to discuss the absence of an objective standard, this paper focuses predominately on CBT for anxiety disorders; however, findings can be applied to various psychological disorders and clinical conditions.

## Résumé

Bien que la littérature fournisse des preuves que la thérapie cognitivo-comportementale (TCC) est un traitement de première ligne efficace dans de nombreux troubles psychologiques, le nombre de cas où cette forme de traitement échoue est considérable. À ce jour, la littérature néglige la grande proportion d'individus qui ne répondent pas au traitement et met l'accent sur les personnes chez lesquelles la TCC apporte des gains fiables. Comment les cliniciens réussissent-ils à savoir si une personne a vraiment répondu à la TCC? Malheureusement, les cliniciens ne disposent pas d'une méthode générale normalisée pour définir la qualité de la réponse au traitement. Au lieu de cela, chaque clinicien utilise une mesure individualisée, ce qui entraîne un manque d'uniformité dans le domaine de la TCC. En raison des lacunes au chapitre des connaissances dans ce domaine, la présente revue de la littérature aborde plusieurs façons de définir la réponse au traitement, tout en

mettant en évidence l'absence de méthode standard pour évaluer l'efficacité. Afin d'explorer l'absence de norme objective, le présent article porte principalement sur la TCC utilisée dans le traitement des troubles anxieux; toutefois, les résultats peuvent être appliqués à divers troubles psychologiques et problèmes cliniques.



Cognitive Behavioural Therapy (CBT) is an empirically supported treatment that aims to alter negative thoughts and actions and implements realistic goals that better manage distressing symptoms. For social anxiety disorder (SAD), CBT aims to reduce patients' negative views of themselves and others thereby increasing the use of cognitive reappraisal strategies in social situations (Moscovitch et al., 2012). Although CBT has shown to be an effective treatment for many individuals, this approach may not be successful for everyone. For instance, despite the recognized value of CBT, only 25-60% of patients with SAD achieve improvements in overall functioning by the end of treatment, while the remainder of the sample fail to adequately respond (Moscovitch et al., 2012). Additionally, a systematic review by Hansen, Lambert and Forman (2002) summarized the literature and found that after 12 to 13 sessions of CBT for anxiety disorders, 57-67% of the sample responded to CBT. Although the current literature demonstrates high rates of treatment non-response, it is still unknown as to why researchers choose to utilize specific measures to determine the rates of treatment success, or whether a different measure would yield the same results. It is important to question whether the rates of treatment non-response for CBT would increase or decrease if all researchers apply a standardized method of defining responder status at post-treatment. Perhaps the varying and inconsistent methods of defining responder status account for the erratic, yet high rates of treatment non-response.

Studies aiming to provide therapeutic interventions for individuals with psychological disorders divide the sample into subsections based on the results at post-



treatment, including a group of people who respond to the treatment and a group who do not. Researchers tend to focus on the subset of the sample that showed positive improvements, while the latter group is often overlooked. However, how do we know who responded to treatment? How do we know what an adequate treatment response is? How can clinicians, with full confidence, state that any particular patient has responded to treatment? These are continuously unanswered questions since clinicians are not trained on a standardized way to define treatment response for CBT, nor to understand whether a patient has successfully responded to treatment. Some researchers (e.g. Rodrigues et al., 2011) acknowledge the lack of a global definition to determine responder status, although, to date, no objective standard has been established.

Therefore, the present paper aims to bring further attention to the need for a standardized method in order to determine what an adequate treatment response is and how to know if a patient receiving CBT has responded. Various ways of defining responders and non-responders are presented, as the literature on CBT tends to overlook the latter group. Distinct examples are demonstrated to suggest a lack of consistency among clinicians, as there is no standardized global measure. Given the limited scope of the present paper in comparison to the large field of CBT literature, only three influential examples with varying methodologies are presented; however, the current literature discusses a multitude of other measures used by clinicians and researchers. These three examples are chosen since various systematic reviews in the literature demonstrated the use of the Reliable Change Index, Clinical Global Impressions-Severity Scale and the Diagnostic and Statistical Manual of Mental Disorders criteria, portraying high rates of clinical implementation in order to understand treatment response.

## **Defining Responders and Non-responders**

### **Reliable Change Index**

Jacobson and Truax (1991) published a paper in which they recommended that clinically significant criteria must be met in order to determine who has and has not responded to treatment. In their paper, Jacobson and Truax (1991) explain that clinical and statistical significance vary greatly, proposing that the former is more useful for therapy, as the latter may not yield reliable data. In other words, a patient who has made a positive statistical change due to therapy may not have truly changed, according to clinical standards.

Jacobson and Truax (1991) recommend measuring clinically significant changes using the Reliable Change Index (RCI). The RCI measures clinically significant data offering a more accurate definition of patient changes while also demonstrating exactly how much change has occurred from pre-treatment to post-treatment. The RCI has four categories, in order from best to worst outcome; *recovered, improved but not recovered, unchanged, and deteriorated* (Jacobson & Truax, 1991). In order to use these categories, a patient must be assessed at pre-treatment and again at post-treatment. There are two criteria that must be met in order to achieve recovered status: 1) the patient's score at post-treatment must have reduced by at least two standard deviations (SDs) compared to pre-treatment, and 2) the patient's score at post-treatment must fall within the range of normal functioning based on the same scale (Jacobson & Truax, 1991). Using a hypothetical example, at pre-treatment and again at post-treatment, a clinician may administer a questionnaire ranging from 0 to 100, with higher scores indicating more symptom severity. This questionnaire may assess the patient's symptomology, behaviour and distress, with scores of 30 or below considered to be normal functioning. Using this example, recovered patients may score 95 at pre-treatment and 10 at post-treatment, demonstrating a decline in severity by at least 2 SDs and a final score in the range of normal functioning. Improved but not recovered status can be portrayed if a patient scores 95 at pre-treatment, and 31 at post-treatment, thereby indicating a change of 2 SDs, but not enough to reach the cutoff score of normal functioning. An unchanged patient may score 35 at pre-treatment and 34 at post-treatment, showing less than 2 SDs of change, and a score above the cutoff of normal functioning. A deteriorated patient would end treatment with a score of greater severity than he or she began with, such as a score increasing from 50 to 60 at post-treatment. Thus, from this example, it is clear that recovered status is ideal, and can only be achieved when both a positive change of 2 SDs has occurred and the post-treatment score falls within the range of normal functioning using the clinicians chosen scale. The RCI is beneficial as the formulas Jacobson and Truax (1991) propose measure patient changes at post-treatment, while accounting for measurement errors and fluctuations derived from imprecise measuring instruments. However, the RCI can only be used on normal distributions, which is not always the case in clinical populations, leading to a lack of generalizability.

### Clinical Global Impressions-Severity Scale

Next, a common clinician-administered scale, the Clinical Global Impressions-Severity Scale (CGI-S), evaluates the effects of therapy on a specific patient over the course of seven days. In order to determine treatment progress, CGI-S scores below the cutoff can define treatment response, while those above show failure (Busner & Targum, 2007). Using this scale, a clinician must assess the patient's behaviour, symptoms and functioning in the past seven days and answer one question, "Considering your total clinical experience with this particular population, how mentally ill is the patient at this time?" (Busner & Targum, 2007). Using his or her previous experiences with similar patients, the clinician evaluates the current patient's severity from 1 (*normal*) to 7 (*among the most extremely ill patients*) (Busner & Targum, 2007). In a recent study, Rodrigues et al. (2011) proposed a systematic review summarizing various studies that used the CGI-S for anxiety disorders. In this paper, when clinicians assessed a patient with panic disorder, CGI-S scores of 2 or lower suggest an absence of panic attacks and thus, responder status. Specifically, CGI-S scores of 1 indicate no presence of symptoms over the last seven days, and scores of 2 suggest subtle or suspected pathology (Busner & Targum, 2007). Logically then, in this systematic review, those who scored above this cutoff should be defined as non-responders; however, one study suggested that a score of 4 or greater meets the criteria for nonresponse, as these patients exhibit residual symptoms at post-treatment (Rodrigues et al., 2011). No information was given for those with a CGI-S score of 3, as this ambiguous value does not apply to responders or non-responders. In referencing the original scale, CGI-S scores of 3 indicate clear symptoms with minimal distress in functioning, scores of 4 propose modest impairments or distress, and scores of 5 suggest intrusive symptoms that impair functioning (Busner & Targum, 2007). On a higher severity level, CGI-S scores of 6 are used when patients require assistance from others, as their behaviours are frequently influenced by disruptive symptoms, and last, scores of 7 suggest that the patient's pathology drastically interferes with many functions, possibly requiring hospitalization (Busner & Targum, 2007). Although the review highlighted that on average, scores of 2 or lower suggests responder status among majority of anxiety disorders, there was great variability across studies. Therefore, while the CGI-S is one example of a scale with cutoffs designed to

help clinicians determine treatment response, there are inconsistencies in how it has been used to measure reliable change within clinical settings. The CGI-S is useful as it combines all available information from the past seven days, such as, clinical interviews and chart notes, leading to a more accurate description of the patient's severity. However, there are no universally accepted scoring methods, as the tool is based on clinical judgment. Lacking a standard method of assessment can lead to varying scores across different clinicians, resulting in low inter-rater reliability.

### Categorical Approach - DSM Criteria

In an example using a categorical approach, Wilson (1996) defined responders and non-responders using the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV criteria. Here, responders are defined as demonstrating complete remission and no longer meeting the DSM-IV criteria for the diagnosis being treated, whereas non-responders still present with enough symptoms at post-treatment to meet their initial diagnostic criteria (Wilson, 1996). With a focus on bulimia nervosa, Wilson (1996) discussed the high rates of treatment failure by demonstrating that 50% of therapeutic cases yield partial or no benefit. In Wilson's (1996) analysis, those who responded to treatment no longer met DSM-IV criteria after treatment cessation, whereas non-responders showed little or no improvement in their DSM-IV diagnosis. According to the categorical approach recommended by Wilson (1996), complete remission without any symptoms after treatment is the only legitimate way to define successful treatment response, thus establishing a highly conservative all-or-nothing operational definition. However, although Wilson (1996) requires complete remission for responder status, other clinicians may use less conservative definitions and consider treatment success to be a reduction in solely one symptom of the DSM-IV criteria. Varying levels of leniency when defining responder status leads to a lack of consistency among clinicians and researchers.

In addition to the discrepancy in deeming patients as treatment responders, the changes within diagnostic criteria across DSM revisions brings rise to many supplementary complications with using Wilson's (1996) approach. By using this approach, it is unclear if a patient who has responded to treatment according to the DSM-IV will still be considered a responder using the DSM-5. For example, compared to the DSM-IV, the DSM-5 alters the symptoms

needed to meet the diagnostic criteria of SAD by changing one symptom in the former version to two separate symptoms in the DSM-5, thereby increasing the number of criteria required for a SAD diagnosis from 8 to 10 symptoms (DSM-5; American Psychiatric Association, 2013). Depending on how clinicians and researchers define the presence or absence of clinical remission, the differences across revisions of the DSM can lead to great inconsistencies in diagnosing disorders and indicating treatment response. For SAD, Wilson (1996) requires an elimination of all eight symptoms using the DSM-IV in order to define responder status; however, it is unclear if a similar reduction of 8 or 10 symptoms is required in the DSM-5 to achieve this same status, due to the increase in diagnostic criteria.

### Summary

This section examined three different ways of defining and operationalizing treatment response and non-response. The purpose of reviewing the aforementioned studies was to highlight the notion that understanding treatment response is a complex process, and to date no single standardized method exists that clinicians and researchers can rely on to do so. Through examining a multitude of approaches, it is clear that there must be a consensus on an objective standard to measure responder status in order to ensure that a patient has truly responded to treatment.

### Discussion

To begin this review, key examples were highlighted showing that there is no current global method used to determine responder status for CBT, leading clinicians to lack full confidence that the responders in their sample have truly succeeded with treatment. It is therefore essential to conduct further research in order to evaluate the methods used in the literature and determine the most successful standard.

Recall that the initial question of this review asked how clinicians could determine who has and has not responded to CBT. Based on reviewing and evaluating the different approaches to defining and understanding treatment response, this paper offers three principles that a clinician must take into account in order to successfully distinguish responders and non-responders. First, measuring treatment response at only one time period is insufficient to adequately understand successful response to treatment. Rather, a clinician must use a standardized and reliable measure to assess the patient before treatment, dur-

ing treatment, and after treatment in order to accurately observe any changes. Second, it is important to use continuous symptom ratings in order to measure change, rather than a discrete approach that only offers the presence or absence of a psychological condition. For example, using the DSM approach leads the clinician to believe a patient either presents with a psychological condition or he or she does not meet criteria for the diagnosis. It would be useful to devise a continuous measure in order to accurately treat the different ranges of symptoms presented by an individual and assess fluctuations throughout therapy. Lastly, when using cutoff scores to determine responder status, clinicians should implement measures that have clear and reliable cutoffs, which consistently distinguish problematic symptoms from normal functioning. These key principles originated from reviewing previous CBT literature for the purposes of this paper; however, other researchers may have varying opinions and perhaps determine other important principles not mentioned here.

One limitation of this paper is the complexities in using one method of assessment in clinical settings. Clinicians using CBT may prefer to combine various methods in specific scenarios, and may also incorporate their own judgment into the patient's responder status, leading to an inability to standardize the definitions of treatment response. Thus, this paper may provide the most benefit for researchers, where standardized methodology is required for reliable conclusions. However, the goals of this paper target both clinicians and researchers by analysing various methods to define responder status for CBT, while highlighting the vast inconsistencies within each approach and indicating the strengths and weaknesses.

Based on this review, the numbers of non-responders are so substantial, clinicians cannot know whether a patient has truly succeeded with CBT, and if they have not succeeded, which strategies they ought to implement to improve treatment response. This is an essential topic that future research must examine in order to provide the best results possible for patients seeking therapy. This paper aimed to further the research by emphasizing the inconsistency within the field of defining treatment response, while highlighting several potential measures and the need to focus on non-responders. Additional research is needed in order to implement a global measure used to train future clinicians and researchers on defining treatment responders and non-responders.



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# The Influence of Vocally Expressed Emotions on Attitude Change

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## Abstract

Despite the large role of oral communication in day-to-day interactions, attitude researchers within social psychology have focused predominantly on the impact of written messages on the persuasive process while largely neglecting to investigate the role played by voice. In the following we discuss two competing perspectives, each of which suggests various ways in which different emotional qualities of voice may influence the success of an affectively-based persuasive appeal. We summarize findings from novel research investigating this question and suggest several potential directions for future study.

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## Résumé

Malgré le rôle important que joue la communication orale dans les interactions quotidiennes, les chercheurs du domaine de la psychologie sociale qui s'intéressent aux attitudes se penchent principalement sur les effets des messages écrits sur le processus de persuasion, tout en négligeant généralement l'étude du rôle joué par la voix. Dans le présent article, nous examinons deux perspectives opposées, qui expliquent chacune à leur façon comment les différentes qualités émotionnelles de la voix influencent la réussite d'un effort de persuasion fondé sur les émotions. Nous résumons les conclusions d'une recherche novatrice qui examine cette question et suggérons plusieurs orientations possibles pour les futures études sur le sujet.



Intuitively, we are all very much aware that voice can tell us a great deal about a speaker beyond the actual content of what is being said. When someone is excited, these feelings of elation are readily discernible in their voice. Likewise, when someone is bored or afraid, we have little difficulty recognizing these emotions in the voice and what they suggest about the speaker's current state of emotion. Beyond intuition, empirical evidence also supports the infer-

ence that the emotional qualities of voice used to deliver a message can have a considerable effect on a listener's perception of its meaning (Cooper & Sorensen, 1981). Indeed, research suggests we are so perceptive at detecting emotion in the voice that even comparatively subtle changes are noticed (Johnson, Ernede, Scherer, & Klinnert, 1986), even in such cases where language barriers prevent understanding of the content (Pell, Monetta, Paulmann, & Kotz, 2009).

Given the prevalence of oral communication in day-to-day interactions and the fact that an extensive body of literature has accumulated demonstrating how vocal perception influences the communication process (e.g., Juslin & Scherer, 2005), one would think there should be a large volume of research investigating the role of voice within the context of persuasion. Yet curiously, attitude researchers within social psychology have largely ignored the potential role of voice as it applies to the success of persuasive appeals. When considering the multifaceted nature of voice, one prominent feature often evident in oral exchanges is its emotionality. In fact, research has documented that as specific parameters of voice change this is reflected by changes in emotionality (Banse & Scherer, 1996; Bänziger, Patel, & Scherer, 2014) This is particularly relevant in light of the large body of work supporting the important role played by affect in persuasion (e.g., Petty, Fabrigar, & Wegener, 2003).

## How Might Vocally Expressed Emotions Influence Attitude Change?

In thinking of how the emotional aspects of voice might influence the persuasion process, an important question that arises is how best to conceptualize voice in terms of its emotional qualities. From a theoretical standpoint, one prevailing view adopted by many emotion researchers suggests that the substantial variability in vocally expressed emotions can be conceptualized along the two orthogonal underlying dimensions of valence and arousal (e.g., Bachorowski, 1999; Bradley & Lang, 2000) As it applies to the persuasion process, this framework highlights

the importance of considering the extent to which a particular emotion conveyed by a speaker's voice is either congruent or incongruent with the intent of the message content. For example, congruency would exist in the case of a speaker who delivered highly fear eliciting content using vocal qualities that reflected fear. Here we see that the vocal qualities expressed by the speaker match the message content both in terms of arousal (high) as well as valence (negative). Incongruency can be thought of either as occurring in part, wherein voice and message are mismatched on one of either valence or arousal, or occurring in full, wherein voice and message are mismatched along both dimensions. For example, partial incongruency would exist in the case where highly fear eliciting content is delivered by a speaker whose vocal qualities reflected either excitement (i.e., matched on arousal yet mismatched on valence), or boredom (i.e., matched on valence yet mismatched on arousal). Full incongruency would exist in the case where highly fear eliciting content is delivered by a speaker whose vocal qualities reflect contentment (i.e., a mismatch on both valence and arousal).

Consider that the expression of emotions allows us to communicate important information to others, which in turn may play a role in influencing their attitudes and/or behavior. Take, for example, a persuasive message designed to elicit fear in the recipient. How might a speaker deliver this content to maximize its persuasive impact on the recipient? Contemporary research suggests two basic perspectives one might take when considering how the interplay between voice and content may regulate the success of a persuasive appeal. The first perspective suggests that persuasion should be enhanced when the emotions in a person's voice (e.g., fear) reflect the content of a message (i.e., voice-content congruency) and reduced when the emotions (e.g., boredom, contentment) are in conflict with the content of a message (i.e., voice-content incongruency). We shall refer to this as the congruency hypothesis.

Current research suggests at least two reasons for these predictions. First, research on emotional contagion has shown that exposure to the emotions of other individuals can in some cases elicit similar emotions in oneself (Hatfield, Cacioppo, & Rapson, 1992; Hatfield & Rapson, 2008; Neumann & Strack, 2000). Thus, voice-content congruency could intensify the affect-eliciting quality of the content and therefore elicit stronger emotional responses in the recipient. In turn, this may enhance attitude change.

Conversely, voice-content incongruency may elicit emotional responses in the recipient that are in conflict with the affect-eliciting intent of the content and therefore attenuate persuasion. A second explanation suggests that voice-content congruency may lead the recipient to conclude that their emotional responses are appropriate, thus providing social validation (Cialdini, 2009; Guadagno, Muscanell, Rice, & Roberts, 2013; Hogg & Reid, 2006). In cases where voice-content incongruency occurs, the recipient may conclude that their emotional responses are inappropriate, thus potentially eliciting a sense of confusion. In turn, this could reduce the impact of the content and therefore attenuate persuasion. Taken together, both theories suggest persuasion may be enhanced by way of voice-content congruency and attenuated when a mismatch between these variables occurs.

Although delivering an affective message using vocally expressed emotions that match the intent of the content certainly seems like a logical approach, our research raises the very counterintuitive possibility that in certain contexts this may actually *not* be the most effective way to elicit persuasion (Guyer & Fabrigar, 2015; Guyer, Fabrigar, & Tang, 2013). For example, when the content of an affective message is very *intense* (e.g., graphic, fear-eliciting content) and thus already able to powerfully elicit the target emotion on its own, voice-content congruency may do very little to enhance the impact of the content. From this perspective, it seems unlikely that persuasion would be engendered by emotional contagion because the target emotion has already been elicited to the greatest extent possible by the content of the message. Likewise, social validation may be ineffectual because the graphic content provides sufficient justification for the appropriateness of the recipient's emotional response. Thus, taken together, emotional contagion and social validation seem more likely to account for the pattern of effects as predicted by the congruency hypothesis only in the context of affective messages that are comparatively *moderate* in intensity.

This leads to the question of how voice-content congruency might influence the success of a persuasive appeal when the message content is comparatively *extreme* (e.g., highly fear-eliciting) in its affective intensity. This brings us to our second perspective. One possibility is that vocally expressed emotions may have little to no effect on persuasion. A second possibility suggests that although in a broad sense voice-content congruency may play an important role in communication, within certain contexts the inter-

play of these variables could impact persuasion in rather counter-intuitive ways. For example, within the context of affective messages whose content is comparatively extreme, vocally expressed emotions may actually enhance persuasion when they are *incongruent* with the affective content of the message. We shall refer to this as the incongruency hypothesis.

Contemporary research suggests at least two possible explanations for this prediction. One possibility is that message recipients may use the speaker's vocal cues as a comparison point against which to gauge the intensity of their emotional responses (Bless & Schwarz, 2010; Wegener & Petty, 1997). For example, a speaker who delivers intense fear-eliciting content using a bored voice may cause the recipient to judge themselves as especially afraid relative to the speaker. Conversely, if the same content were delivered using a fearful voice, this may lead the recipient to judge themselves as comparatively less afraid relative to the speaker. A second explanation is that voice-content incongruency could influence recipients' attributions regarding the source of their emotional responses (e.g., Taylor & Fiske, 1978). For example, if intense, fear-eliciting content was delivered using a bored voice, the source of the recipient's emotional response should be relatively unambiguous. In this case, it is unlikely that recipients will attribute their experience of fear to the speaker but rather to the attitude object described by the content. Thus, recipients' emotional responses should be perceived as diagnostic of their target-relevant attitude. By contrast, if the same content was delivered using a fearful voice, the source of recipients' emotional responses may be somewhat ambiguous. That is, the recipient may now be uncertain as to whether the source of their emotional responses is the fearful sounding speaker or the attitude object described by the content. Consequently, the recipient may perceive their emotional response as potentially non-diagnostic of the attitude object. Thus, in the context of a strongly affective message, voice-content incongruency could enhance the negative affect conveyed by the content therefore increasing attitude change, whereas voice-content congruency could undermine the negative affect, thus potentially attenuating attitude change.

Indeed, over several experiments, our data supports the idea that within the context of strongly affective messages, voice-content incongruency can enhance persuasion, whereas voice-content congruency provides no added benefit relative to the written

content on its own (Guyer & Fabrigar, 2015; Guyer, Fabrigar, & Tang, 2013). Moreover, our data suggests this outcome can at least in part be explained because people tend to use their attributions regarding the source of their emotional responses as a basis for changing their attitude (Guyer & Fabrigar, 2015). Although this voice-content incongruency effect is very intriguing, we do not expect its impact on persuasion to be the same in all contexts. For example, when delivering only *moderately* affective content, voice-content congruency could enhance persuasion either by way of emotional contagion or social validation processes, whereas voice-content incongruency could attenuate persuasion via the same processes. Importantly, the processes suggested by both social comparison and attribution explanations can also be applied in the context of a moderately affective message. One project currently underway tests this idea in the context of an affective message that uses only *moderately* intense content. In line with expectations, preliminary analyses reveal our data generally fits the expected pattern. That is, conveying moderately fear-eliciting content using a fearful voice (i.e., voice-content congruency) produces attitudes that are significantly more negative toward the target than attitudes produced by the content alone. Conversely, in cases where the same content is delivered by an excited or content sounding speaker (i.e., voice-content incongruency), attitudes toward the target are significantly less negative than attitudes produced by the content alone. Furthermore, as found in the context of comparatively intense affective messages, our data suggests this pattern of effects is also mediated at least in part by a person's attributions regarding the source of their emotional responses (Guyer & Fabrigar, 2015).

### Implications and Future Directions

Confirming our everyday experience, empirical research has shown that the content of a message is an important factor in determining the success of persuasive appeals. However, our everyday experience also suggests that how a message is conveyed (i.e., emotions expressed through the voice) matters. To this point, research in social psychology has largely ignored how different characteristics of voice might influence the persuasion process. The research discussed here provides an initial step towards helping us to better understand the role of voice in persuasion. Importantly, this research suggests the influence of vocally expressed emotions plays a more

nuanced role than the relatively straightforward conceptualization advocated by the voice-content congruency perspective. For instance, whereas in certain contexts voice-content congruency may enhance persuasion, in other contexts this outcome may best be achieved when delivering messages in which voice and content are in conflict with one another. Furthermore, this research suggests that the complex interplay between vocally expressed emotions and the content of a strongly affective message may influence persuasion based on an individual's perceptions regarding the source of their emotions.

Given the largely unexplored role of voice in the persuasion process, there are numerous exciting directions one might take when designing future studies. For example, it would be valuable to test whether the pattern of effects observed in our studies can be extended to other vocally expressed emotions such as anger, excitement, and sadness. Additionally, investigating whether these effects also emerge in the context of messages intended to elicit emotions other than fear would be quite useful from both a practical and theoretical perspective. A further direction could involve manipulating the intensity of the vocally expressed emotion. If one considers the wide range of intensity with which a given emotion can be expressed, it seems plausible that, similar to the affective intensity of the content, this too may play an important role in the success of a persuasive appeal. Finally, given the inherent complexity involved in interpersonal communication, another potential direction involves exploring how persuasion is influenced by the interplay between vocal affective cues and other non-verbal aspects of communication such as facial expressions. Similar to voice, facial expressions also provide a rich variety of information that likely interacts in important ways with vocal affective cues to influence attitude formation and change. Examining how varying combinations of facial features, vocal qualities, and message content might interact to regulate the persuasion process is an important next step in disentangling how a multitude of factors work in combination with one another to influence the efficacy of persuasive appeals.

From a more practical standpoint, consider how a better understanding of vocal qualities might increase the effectiveness of sales pitches; whether delivered over the radio, on television, or in a face-to-face context. Moreover, those in politics, education, health-care, and business could benefit through training that enabled them to be more per-

suasive communicators. Thus, along both practical and theoretical lines, this emerging area of research holds great promise for advancing our understanding and application of perhaps the most empirically overlooked aspect of communication: the voice.



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