

KOÇ UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES & HUMANITIES

BRIEF SOCIAL PSYCHOLOGICAL INTERVENTIONS TO REDUCE ACADEMIC
ACHIEVEMENT GAP

BY

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A Dissertation Submitted for the degree of Doctor of Philosophy in Psychology Koç

University

July 2021

KOÇ UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES & HUMANITIES

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STATEMENT OF AUTHORSHIP

This thesis contains no material which has been accepted for any awards or other degree or diploma in any university or other institution. It is affirmed by the candidate that, to the best of her knowledge, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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THESIS ABSTRACT

Disparities in academic achievement between different social groups persist. Even though several structural factors are known to contribute to these gaps, psychological processes have been also suggested to play a major role, especially among minority or female students. A major social psychological phenomenon that has been shown to interfere with academic motivation and performance is one's feeling of threat to his/her social identity or sense of belonging. *Brief Social Psychological Interventions* (BSPIs) which aim to change the disadvantaged students' thoughts, feelings, and beliefs are suggested to successfully eliminate the detrimental effects of these psychological challenges. The objective of the present thesis was to examine the effectiveness of BSPIs and their customized versions in reducing academic achievement gap among female or minority children and youth. Chapter II systematically reviewed forty randomized trials that focused on the effect of values affirmation, role model, growth mindset, and social-belonging interventions on students' academic outcomes. Even though effect sizes greatly varied, majority of the studies indicated the positive impact of interventions on grades, task performance, and psychological outcomes of disadvantaged students attending middle school to college. Findings suggested that BSPIs constitute a promising cost- and outcome-effective way of reducing academic achievement gaps. Chapter III examined if an adapted version of self-affirmation intervention following a multi-threat framework can enhance the mental task performance of female college students under stereotype threat and whether gender group identification moderates the effectiveness of this adapted intervention. In experiment 1, under self-as-target stereotype threat, as expected, students who were exposed to the self-affirmation intervention had the highest task performance. However, under group-as-target stereotype threat, similar performances of the students in both the self-affirmation and group-affirmation conditions compared to control condition were found. In experiment 2, it is shown that the extent a female student was

identified with her gender group moderated the effectiveness of the group-affirmation intervention. Results encourage researchers to consider different understandings of self while instituting common stereotype threat interventions rather than taking a uniform approach. Chapter IV investigated the transportability and adaptability of the social belonging intervention that has been shown to increase the sense of belonging of disadvantaged students and, in turn, increase their academic achievement, to the refugee context for the first time. Findings of two randomized experiments with 532 Syrian refugee and Turkish middle-school students showed that the customized social belonging intervention enhanced refugee students' potential to succeed in school, performance state self-esteem and identification with school (in the first experiment) and social belonging in school and school trust (in the second experiment). Results of this study encourage further research to explore effective interventions to ease the academic and related psychological difficulties faced by refugee students.

TEZ ÖZETİ

Farklı sosyal gruplar arasındaki başarı farkı devam etmektedir. Birçok yapısal faktörün bu farka neden olduğunun bilinmesine rağmen, psikolojik süreçlerin de özellikle azınlık ve kadın öğrenciler arasında büyük bir rol oynadığı önerilmiştir. Akademik motivasyonu ve performansı engellediği gösterilen başlıca sosyal psikolojik bir fenomenin kişinin sosyal kimliğine ve aidiyetine karşı hissettiği bir tehdittir. Kısa Sosyal Psikolojik Müdahaleler (KSPM), dezavantajlı öğrencilerin akademik atıflarına ilişkin düşüncelerini, hislerini ve inanışlarını değiştirmeyi hedef alarak, kötü etkileri olan bu psikolojik açmazların başarılı bir şekilde ortadan kaldırması için önerilmişlerdir. Bu tezin amacı kısa sosyal psikolojik müdahalelerin ve uyarlanmış versiyonlarının kadın ve azınlık çocuklar ve gençler arasındaki başarı farkını azaltmaya yönelik etkilerini incelemektir. İkinci bölüm kırk randomize çalışmayı değer-olumlama, rol model, gelişim odaklı zihin ve sosyal-aidiyetlik müdahale yöntemlerinin öğrencilerin akademik çıktıları üzerindeki etkisine yoğunlaşarak sistemli bir şekilde incelemiştir. Etki büyüklüklerinin anlamlı bir şekilde çeşitlilik göstermesine rağmen, çalışmaların büyük çoğunluğu kısa sosyal psikolojik müdahalelerin ortaokuldan üniversite düzeyine kadar olan dezavantajlı öğrencilerin ders notları, görev performansları ve psikolojik çıktıları üzerinde olumlu bir etkisi olduğunu göstermiştir. Bu bulgular kısa sosyal psikolojik yaklaşımların öğrencilerin performans farkını uygun maliyet ve sonuç temelinde anlamlı olarak düşürmekte önemli potansiyele sahip olduğunu önermektedir. Üçüncü bölüm, uyarlanmış değer-olumlama müdahalesinin farklı formlardaki kalıp yargı tehditleri takiben STEM alanlarındaki kadın öğrencilerin performansları üzerinde bir etkisi olup olmadığını ve cinsiyet grup özdeşleştirilmenin bu müdahale yönteminin etkililiğini modere edip etmediğini araştırmaktadır. Birinci deneyde, özü hedef alan kalıp yargı tehditler koşulu altında, beklendiği üzere, öz-olumlama müdahalesine maruz bırakılan öğrenciler en yüksek performansa sahiptirler. Ancak grubu hedef alan kalıp yargı tehditler altında, hem öz-

olumlama hem de grup-olumlama müdahale koşulunda olan öğrenciler için kontrol koşulundakilere kıyasla benzer sonuçlar bulunmuştur. İkinci deneyde ise, bir kadın öğrencinin kendi cinsiyet grubuyla ne derece özdeşleştiğinin grup olumlama müdahalesinin etkisini modere ettiği gösterilmiştir. Sonuçlar, araştırmacıları yaygın kalıp yargı tehditlere yönelik müdahaleleri tesis ederken tekdüze bir yaklaşımdan ziyade öze yönelik farklı yaklaşımları da dikkate almaları konusunda cesaretlendirmektedir. Dördüncü bölüm sosyal aidiyet müdahalesinin, ki ilk defa mülteci bağlamında dezavantajlı öğrencilerin aidiyet hissini yükselttiği ve akabinde akademik başarılarını yükselttiği de gösterilerek, taşınabilirliği ve uyarlanabilirliğini incelemektedir. 532 Suriyeli mülteci ve Türk orta okul öğrencilerinin olduğu iki randomize çalışmanın bulguları, özelleştirilmiş sosyal aidiyet müdahalesinin (birinci deneyde) mülteci öğrencilerin okul başarı potansiyellerini, performansa bağlı durum öz-saygılarını ve okulla özdeşleşmelerini, (ikinci deneyde ise) okuldaki sosyal aidiyetliklerini ve okula duydukları güveni arttırdığını göstermiştir. Bu çalışmadan elde edilen sonuçlar ileriki araştırmaların mülteci öğrencilerin karşılaştığı güçlüklerle karşı akademik ve psikolojik refahlarını arttırmak için etkili müdahale yöntemlerini irdelemesini desteklemektedir.

DEDICATION

to my lovely family...



ACKNOWLEDGEMENTS

Completing this PhD was a very different and time to time challenging experience for me, and many significant people made it possible with their appreciable support, presence, and guidance.

I would like to begin with my thankfulness to my supervisor Assistant Professor Yasemin Kisbu-Sakarya who provided perpetual support, encouragement, and guidance throughout my PhD. She was always very kind and considerable toward me. Her insightful and inspiring supervision always increased my motivation. Her positive and supportive attitudes throughout my PhD journey made me feel secure and made this thesis work possible. During this five-year long period, I have learned a lot from her. She not only contributed to my academic skills, but also contributed to my personal abilities. I am feeling so lucky to have such an amazing teacher and academic advisor during my PhD. She is an inspiring role model to me. Therefore, I would like to thank so much for her precious support and guidance.

My second thankfulness is for my thesis committee members Prof. Sami Gulgoz, Prof. Hale Bolak Boratav, Associate Prof. Zelha Tunc-Pekkan and Assistant Prof. Terry Eskenazi for their supportive guidance and great contributions to my PhD thesis. Their constructive comments and positive guidance throughout the studies improved its scope and content.

I also would like to thank very much to the members of Independent Evaluation Laboratory at Koc University under the supervision of Yasemin Kisbu-Sakarya, including Dilek Uslu, Gamze Turunc, Meryem Seyda Ozcan and Cesi Faraci. Their supportive acts toward me in any challenges that I have encountered during my PhD always increased my motivation and engagement. They created a very intellectual, enthusiastic, and pleasant working environment which helped me to work contentedly. I would like to extend my many

thanks to my other graduate friends, including Hulya Mutlu, Volkan Guney Kuru, Ulker Isayeva, Salome Shelia, Ceymi Doenyas, Muge Akbulut, Elcin Ray, Gulsah Kurt, Seniha Ozden, and Didar Zeytun. Their presence always made me so happy and helped me to complete my PhD very smoothly.

I also would like to express my gratitude to GSSSH Office members. First and foremost, I would like to thank very much to Tugce Satana, then to Turkan Inci Dursundag, Gulcin Erdis, Irmak Tastan Kaplan, Beril Erdem and Doga Dilbilmez, for their very precious continues supportive and facilitating attitudes toward me throughout my PhD.

I would like to thank very much to my lovely family and close friends. I would like to state my greatest appreciation to my parents Aliriza Cetinkaya and Inci Cetinkaya. They always provided their unconditional love and moral and material support in any acts that I have taken throughout my personal and academic life. They always told me not to withdraw in the face of challenges and they encouraged me to strive against difficulties. So, any words are not enough to verbalize how grateful I am to my father and mother just because of their presence. They made me kind a strong individual who is looking to the future with a great hope. I would like to extend my many thanks to my lovely older brother Eser Cetinkaya, my beautiful sister Esma Cetinkaya, and my beloved elder brother Muratcan Cetinkaya. Their constructive communications always motivated me, and I did not feel lonely in any time of my life. They always paid very much attention to what I am saying without judging, and they carried all the process with me with their precious presence. I also would like to thank very much two special persons that I love as my sisters, Hacer Aksu and Aylin Ecem Ceylandag, who provided their full support for more than 10 years.

Finally, my beloved fiancée Bahadır Selcuk deserves the greatest thanks, who was exposed to my continues complaints during my PhD, who acknowledged my bad feelings and carried all the stress with me. He is my lover, best friend, my helpmate more than 6 years. He

was always my biggest supporter to tackle with adversities. He never spared his love, compassion, and his moral and material support from me. I am feeling so much lucky to have such a great man in my life.



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CHAPTER 1

GENERAL INTRODUCTION

Academic achievement gap which refers to the persistent performance inequality between distinct social groups such as between male and female students or between majority and minority students, possibly constitutes the most constant, disturbing, and enduring challenge in the educational context. Several studies documented the underperformance of female students and/or minority students on school related outcomes (e.g., GPA, course grades, school disciplines) relative to their peers (Cohen et al., 2006; 2009, Martens et al., 2006; Miyake et al., 2010; Dee, 2015; Covarrubias et al., 2016). For example, female and male students have been shown to perform comparable when they were given an intermediate level test. Nevertheless, female students perform poorer than their male counterparts when the test includes more complex math questions (Gallagher et al., 2000; Kimball, 1989), especially in contexts characterized by gender biases (Steele et al., 2002).

An earlier explanation of performance disparity has often centered on the effects of structural factors such as the quality of class or schools and the shifts in the family background (e.g., Guryan, 2004; Johnson, 2011; Reber, 2010). For example, a recent study reported that court-ordered school desegregation programs have boosted African American students' educational attainment in school performance, through suggesting the enhancement in the quality and the efficiency of the school (Johnson, 2011). Another widely discussed and suggested explanation regarding the underrepresented and disadvantaged students' academic achievement relies on the social-psychological predicaments, which is a threat either to one's social identity (Steele & Aronson, 1995) or the sense of belonging (Walton & Cohen, 2007). *Stereotype threat* refers to the claim that a worry for one's own behavior being perceived negatively which accordingly decrease one's achievement (Steele & Aronson, 1995). For instance, mostly in performance testing environments, the assumptions that women are not as

good as men in quantitative fields such as physics and math and some social groups (e.g., African American, Hispanic Americans) are not intellectually capable compared to other groups (e.g., European Americans, Asian American) generate distress and diversion, especially for individuals whose concern centers on conforming these negative stereotypes are true, hurts their academic and psychological outcomes (Schmader et al., 2008).

Stereotype threat is not considered independent from “*belonging uncertainty*” which refers to the lack of sense of belonging to a particular setting (such as toward school or college in educational context, Walton & Cohen, 2007; 2011). Many stigmatized students also struggle against the question related one’s own belonging in a given academic setting, which impair their academic achievement. Research have demonstrated that although students have ostensibly comparable setting, students who contend with stereotype threat and belonging uncertainty have considerably distinct subjective negative experiences. For example, when a task is posed as an intelligence test, it has a detrimental effect on the grades of minority students, however, it does not necessarily influence the majority students’ educational outcomes, although they share similar educational background (Steele & Aronson, 1995). Furthermore, it has been shown that students whose focus is more centered on his/her academic success, are more vulnerable and susceptible to the pernicious effect of stereotype threat (Aronson et al., 1999; Osborne & Walker, 2006). For example, minority students who concern to have better performance at school, had the highest school drop-out rate, while non-minority students’ concern was not associated with the school withdraw (Osborne & Walker, 2006). And many more studies have indicated the detrimental effects of stereotype threat and belonging uncertainty on task and school performance of stigmatized students (Walton & Cohen, 2007; 2011; Walton & Spencer, 2009; Schmader & Johns, 2003; Cohen & Garcia, 2005; Shapiro et al., 2013).

Considering the underperformance of disadvantaged students, brief social psychological interventions (BSPIs) (e.g., values affirmation, role modeling, theories of intelligence, social belonging, possible selves, reappraising) have been developed which is believed to eliminate the negative impact of psychological predicaments. On the contrary of traditional approaches which aimed to focus on the objective features of the schools and academic content, these interventions intended to change students' subjective experiences through providing a new perspective (Wilson, 2006; 2011). Although these interventions differentiate in terms of their forms, yet they share some critical aspects. Each strategy targeted the subjective experiences of students to ultimately close the academic achievement gaps.

Previous studies tested the effect of these remarkably simple but powerful interventions to enhance both academic and psychological outcomes of stigmatized students by mitigating the effects of stereotype threat and belonging uncertainty (Cohen et al., 2006; 2009; Martens et al., 2006; Miyake et al., 2010; Marx & Roman, 2002; Herrmann et al., 2016; Good et al., 2003; Oyserman et al., 2002; 2006; Walton & Cohen, 2007; 2011). For example, several studies have shown that the achievement gap decreases when the test presented in a more neutral and undiagnostic way (Good et al., 2008; Keller & Dauenheimer 2003; Kellow & Jones, 2008), and the reported effect sizes are quite large. Another example, female students who were simply delivered the message that intelligence (which highlighted as the focal point of stereotypes) is not a fixed entity and can be improved over practice and time, significantly enhanced their reading achievement and math performance (Good et al., 2003). The short-term effect of the intervention also provides a basis to keep the intervention effect further through starting the positive feedback cycle between the students and their socio-academic environment. For example, it has been shown the effect of simply writing about important values for 15-minutes lasts two years after the first time the intervention was

delivered to middle school students, who then reported higher GPAs in their core courses (Cohen et al., 2009).

Given this background, by highlighting the negative effect of stereotype threat and belonging uncertainty result in motivation and performance impairment of disadvantaged students, this thesis built on the previous research and examined the effect of brief social psychological interventions in educational context.

Study I systematically evaluated 40 studies in terms four different intervention type (values affirmation, role modeling, growth mindset, and social belonging), addressed achievement gap (e.g., racial, gender), age-group (e.g., middle school, high school, college), outcomes measures (e.g., GPA and course grades, performance tasks, and psychological) and effect size (e.g., small, medium and large). BSPIs are increasingly implemented to boost performance of underrepresented and stigmatized students especially in educational context, however, effect of these interventions was not systematically evaluated. Thus, this study addresses the clear need for a systematic review of BSPIs for closing achievement gaps and increasing academic performance.

Study II specifically focused on gender achievement gap which mostly resonates in science, technology, engineering and mathematical (STEM) fields. Female students in STEM are more likely to withdraw from school, have lower exam and course grades and perform worse than their male counterparts (Steele et al., 2002). Therefore, the main objective of the Study II is to test the adapted version of values affirmation intervention in a series randomized controlled trials to enhance the mental task performance of female college students under stereotype threat in STEM. Although testing the transportability and adaptability of the intervention is important, what is more important is to insight into for whom the original and adapted version of these interventions would work the best. Therefore, we tested the moderation effect of gender identification as a follow up study in the Study II.

Study III focused minority achievement gap to develop a brief adapted social belonging intervention for Syrian refugee students who have resettled in Turkey. The number of refugee students in primary and middle schools are increasing in Turkish academic communities, which has reached over 1 million. Structural and psychological conditions position these students as a high-risk group for academic achievement. Even as many school-age children may fail to adapt to school (Roeser, Midgley, & Urdan, 1996; Goodenow, 1993), refugee children experience additional difficulties only because of their refugee status, in which their sense of social belonging being challenged through being exposed to a totally different language, even a new alphabet and to develop a new social identity, leaving them more susceptible to exclusion and separation (Seker, Sirkeci, 2015; Coll & Magnuson, 1997; Sahin & Sumer, 2018). Therefore, it is very possible for those students to lose their interests and motivation toward school environment and academic success. To the best of my knowledge, previous studies mostly tried to describe the drawbacks that Syrian students experienced (Coll & Magnuson, 1997; Seker, Sirkeci, 2015; Sahin & Sumer, 2018), however, there is only a scant research that focuses interventions targeted integration challenges. Therefore, Study III went beyond the scope of identifying the specific challenges that Syrian students face, it aimed to intervene for refugee students to enhance their both academic performance and psychological well-being through improving their sense of belonging.

CHAPTER 2

THE IMPACT OF BRIEF SOCIAL PSYCHOLOGICAL INTERVENTIONS TO REDUCE ACADEMIC ACHIEVEMENT GAP: A SYSTEMATIC REVIEW OF THE EVIDENCE



Çetinkaya, E., Herrmann, S. D., & Kisbu-Sakarya, Y. (under review). The Impact of Brief Social Psychological Interventions to Reduce Academic Achievement Gap: A Systematic Review of the Evidence.

Abstract

Large discrepancies in academic achievement among different social groups persist. Even though several structural factors are known to contribute to these gaps, psychological processes such as one's feeling of threat to his/her social identity or sense of belonging, which can interfere with performance, have been also suggested to play a major role, especially among minority or female students. This systematic review aims to evaluate the effectiveness of brief social psychological interventions that focus on the subjective experiences of students in closing the gender or ethnic academic achievement gaps. Forty randomized trials conducted with students attending middle school to college were included. Although effect sizes greatly varied in size, majority of the studies indicated the positive impact of interventions on improving grades, task performance, and psychological outcomes. Findings suggest that brief social psychological interventions constitute a promising cost- and outcome-effective way of reducing academic achievement gaps.

Keywords: academic achievement gap, systematic review, role model, values affirmation, belonging, growth mindset

1. Introduction

Large discrepancies in academic achievement between different social groups persist. Even though several structural factors are known to contribute to these gaps, psychological processes have been also suggested to play a major role, especially among minority or female students (Walton & Spencer, 2009). A major social psychological phenomenon that has been shown to interfere with academic motivation and performance is one's feeling of threat to his/her social identity or sense of belonging (Steele et al., 2002; Walton & Cohen, 2007; 2011). Stereotype threat research indicates that concerns related to negative stereotype threat can be a barrier to one's success in a stigmatized domain (Steele & Aronson, 1995). For example, the stereotypes that women are unskilled in quantitative areas compared to men and that certain ethnic groups are intellectually inferior to others create anxiety and distraction, especially affect individuals who are concerned about endorsing and encouraging these negative perceptions toward their social groups, in performance testing conditions, which, in turn, impair their academic performance (Schmader et al., 2008). Stereotyped students also contend with *belonging uncertainty* (i.e., the feeling of not belonging in a particular setting). Situations that question one's belonging in a certain academic environment also impair academic performance (Walton & Cohen, 2007; 2011). It is shown that students targeted by stereotypes have markedly different subjective experiences in the face of stereotype threat and belonging uncertainty. For instance, minority students (e.g., African Americans) performed poorly when a particular task was introduced simply as an intelligence test, however, there had been no such effect on the majority students (e.g., European Americans) with similar educational backgrounds (e.g., year in school, major) (Steele & Aronson, 1995).

Brief social psychological interventions (BSPIs) that focus on the subjective experiences of these students who underperform have been developed to mitigate the detrimental effect of these psychological processes. Such interventions do not aim to teach

academic content, rather they aim to change students' perceptions, thoughts, feelings, and beliefs (Wilson, 2006; Cohen & Garcia, 2014). These interventions can be in different forms, such as a simple writing exercise, reappraising the stress of an upcoming exam, or reshaping beliefs about the nature of intelligence. In general, BSPIs provide a new insight into how a student evaluates his/her experiences (Wilson, 2006; 2011). For example, an African American student's recent achievements and failures may determine his eagerness to attend school. However, these daily fluctuations toward school may be reduced by highlighting that belonging uncertainty is common to many students and short-lived. (Walton & Cohen, 2011). Furthermore, these intervention effects have been found to last for a long period of time by launching a positive and self-sustaining interaction cycle between the student and their social surrounding. For example, a study has shown that a values affirmation intervention targeting middle school students positively influenced the students' GPA in main courses even after two years (see Cohen et al., 2009). Below, we describe these interventions, their theoretical mechanisms, and findings about their effectiveness.

1.1. Brief Social Psychological Interventions and Their Mechanisms of Effectiveness

1.1.1. Values Affirmation

Self-affirmation theory argues that individuals are driven to keep their sense of self-worth, general feeling of self-efficacy, and self-integrity (Steele, 1988). An essential principle of the affirmation theory is that the self as a system is dynamic, flexible, and adaptive; therefore, people can restore their self-integrity through relying on psychological resources. Thus, self-affirmation intervention encourages people to reflect their significant values in the face of a threat to regain their overall positive self-view. The recovery can occur in three different ways (Cook et al., 2012; Yeager & Walton, 2011). First, when people face threats to their identity, affirming values important to them strengthens their self-resources to overcome these threats. Second, values affirmation allows people to get a more extensive perception of

themselves, while focusing less on the threat per se. And finally, the affirmation intervention disconnects the relationship between the self and the threat by placing the threat in the form of a general self-integrity.

In a standard manipulation of affirmation, students write about values important to themselves, but different from the threatening domain (Steele, 1988). In practice, students in the values affirmation condition are expected to first select and then explain the reason why the selected value is important to them (while the control group participants select the least important value) (see Cohen et al., 2006; Martens et al., 2006; Miyake et al., 2010; Covarrubias et al., 2016). These self-selected criteria constitute the core feature of the values affirmation which leads individuals to think about their overall self-perception and, as a result, be more adaptive in their responses to threats (Sherman, 2013).

Devaluation of one's social identity (e.g., race, gender) is a persistent cause of academic underperformance. Values affirmation approach renders the threat to identity less stressful by emphasizing the importance of one's sense of values (Steele, 1988), which in turn enables disadvantaged students to concentrate more on the academic tasks (e.g., studying and learning), instead of the self-evaluative implications of the task at hand. Social psychological interventions that have included values affirmation have brought both short- and long-term gains on academic performance (Cohen et al. 2009; Cohen et al. 2006; Cook et al. 2012; Miyake et al. 2010; Shapiro et al., 2013; Sherman et al., 2013). For instance, Latino American middle school students who were assigned to the values affirmation condition had significantly higher GPAs at the end of the school year; however, control group students' performance decreased (Sherman et al., 2013).

1.1.2. Role Model

Role models are individuals who are examples of achievement in a particular domain and motivate people as they point to certain goals and offer the routes that one may pursue to

accomplish those goals (Lockwood & Kunda, 1997). They may be different with regard to race, age, and sex; however, a common characteristic is that they need to be perceived as competent in their respective fields (Marx & Roman, 2002). There is no requirement of direct contact with a role model, as long as the role model's proficiency and accomplishments in the shared domain of interest are clear for individuals who take them as exemplar (Marx & Roman, 2002). Role models are suggested to remediate the detrimental effect of threats because information about successful in-group members reduces concerns as they positively represent the group in a negatively stereotyped domain (Shapiro et al., 2013; Herrmann et al., 2016; Marx et al., 2009). More specifically, role models provide evidence that the negative stereotypes held about a particular group (e.g., female students lack quantitative skills) are not true.

In a typical role model manipulation, students read about the success of an in-group member (e.g., female) who is competent in the stereotyped area (e.g., math), whereas students in the control condition read about neutral topics. Brief interventions that have featured role model exposure have shown that role models increase the academic performance of negatively stereotyped groups (Marx & Roman, 2002; Marx et al., 2005; Herrmann et al., 2016). For example, female students who have read about a female student with impressive achievements in science, technology, engineering, and math (STEM) fields, had better scores on a diagnostic math test compared to students in the control condition (Marx et al., 2005). Similarly, if their qualified experimenters were also female, female students' performance was higher on a diagnostic math test (Marx & Roman, 2002).

1.1.3. *Theories of Intelligence (Growth Mindset)*

Beliefs about someone's own intellectual capabilities may differ among students. Some would claim that intelligence is unchangeable and constant (an *entity* theory), while others would just believe that it is malleable and can be improved (an *incremental* theory;

Aronson et al., 2002; Blackwell et al., 2007). Holding different conceptions of intelligence can lead to different reactions when facing threats and challenges. For example, for many who assume that intelligence is predetermined, their achievement motivation may be more fragile, and they can easily give up completing a particular task; however, students who embrace the malleable nature of the intelligence may be more inclined to continue their efforts in the face of challenges (Spitzer & Aronson, 2015).

Beliefs about the nature of intelligence can be reshaped by teaching students to hold more positive beliefs about effort. In a standard procedure of the manipulation, students in the incremental theory condition are taught that the brain resembles to a muscle and can improve with time, while students in the control condition do not receive the key psychological message that intelligence is dynamic (see Paunesku et al., 2015). Indeed, growth-mindset manipulation, through delivering a message emphasizing the importance of effort, reduces performance anxiety (e.g., performing poorly is a sign that they are not smart enough) and negative reactions to failure.

Several studies have shown that teaching a malleable theory of intelligence successfully enhances academic performance across different outcomes (Aronson et al., 2002; Blackwell et al., 2007; Good et al., 2003; Yeager & Dweck, 2012; Yeager et al., 2014; Paunesku et al., 2015). For example, a study which compared a group taught the incremental theory of intelligence and a control group (either *multiple intelligence model of ability* or no treatment, see Aronson et al., 2002) reported that students who had been trained to believe that intelligence is dynamic and can grow (i.e., incremental theory of intelligence) had better grades than students in the control condition. A study conducted by Good et al., (2003) also reported that a malleable theory intervention caused a significant enhancement in the standardized test scores of adolescents receiving it, compared to control group.

1.1.4. Social-Belonging

During transition to a new academic environment, students' concern may centre on whether others will accept them, especially when they belong to a socially stigmatized group. One of the most significant fundamental human motives has been proposed as having a *sense of belonging* and feeling part of a social group (Baumeister & Leary, 1995). Therefore, students are more likely to disengage from the current academic environment when they have *belonging uncertainty* which also leads them to withdraw more easily when facing threats.

Social-belonging intervention aimed to modify students' thoughts, beliefs, and feelings about the challenges, negative experiences, and adversities that they have encountered in their academic life (Walton & Cohen, 2007; 2011). It is known as a lay theory intervention that helps individuals appraise the drawbacks that they experience through emphasizing contextually specific beliefs related to both academic and social belonging. The suggested theoretical model including the recursive process of lay theories (i.e., belief, psychological interpretation, behavioural response, and academic outcome) influences the stigmatized students' academic outcomes during critical transitions (Yeager et al., 2016). Just to provide an example, it may be extremely challenging to start going to college, students may experience several difficulties, such as getting used to a new environment, struggling academically (e.g., having low exam scores), and feeling alone. Reconceptualizing these experiences (in which students' beliefs were changed as it is a process) as not unique to them and common to all students (psychological interpretation) can lessen worries about belonging and, in turn, enable them to have sustained engagement with their academic environment (behavioural response) and boost their academic performance (academic outcome).

In a standard procedure of the induction, students read about the findings of a survey that was carried with more senior students who have first experienced the feeling of not belonging to a particular school setting but later an increased confidence about their belonging through time. Next, students are videotaped giving a speech to future incoming

classes of students to talk about their negative experiences about belonging in school setting which diminish with time (e.g., see Walton & Cohen, 2007; 2011).

Normalizing feelings of not belonging to a particular school environment and emphasizing that such feelings are just temporary result in increased academic performance (Walton et al., 2015; Herrmann et al., 2016; Walton & Cohen, 2007; 2011). For example, in one experiment, African American students exposed to the belonging condition had increased GPAs for three successive years relative to African American students exposed to the control condition, and those students in the belonging condition achieved to be in the top quartile of the class as well (Walton & Cohen, 2007; 2011).

1.2. Present study

BSPIs are increasingly being implemented in educational settings. This review aims to synthesize the existing literature that investigates the effectiveness of each unique intervention (e.g., values affirmation, social belonging) and to evaluate the effectiveness of BSPIs aiming to reduce achievement gaps in general. The current review aims to determine which aspects of BSPIs are most beneficial for improving academic outcomes and reducing achievement gaps (e.g., minority, gender) of different age-groups. We intended to do this by performing a comprehensive and systematic review of studies testing the effectiveness of BSPIs for increasing the academic performance of students in educational contexts. In the present work, we aimed to extend previous theoretical reviews (e.g., Spitzer et al., 2015) through conducting a systematic literature search investigating the effect of these theoretically similar interventions (i.e., BSPIs) on students' academic outcomes.

2. Method

2.1. Literature Search

A literature search for studies published or presented between the years 2002 and 2020 was carried out through following electronics databases: Cochrane Library, Web of

Science, PsycINFO, and Google Scholar. Search terms were limited to keyword, abstracts, and titles, and differed in terms of search platform demands. Filters were used in the search procedure for context (e.g., education), achievement gap (e.g., gender, racial, minority), and type of study (i.e., randomized trial interventions). This procedure established a reference list of articles identified in order to search for relevant studies.

2.2. Inclusion and Exclusion Criteria

Studies on brief social psychological interventions were included if the following inclusion criteria were met: (a) only studies with randomized trials, (b) interventions specifically designed to reduce the stereotype threat or belonging uncertainty, (c) interventions targeting and measuring academic related performance (e.g., GPA, course grade) or academic related psychological outcomes (e.g., self-appraised math ability, self-esteem) and addressing racial or gender academic achievement gap. Interventions where academic achievement gaps were not addressed, interventions that targeted other gaps between groups (e.g., generational gap), and interventions that have been tested in a domain different than education (e.g., health, organization) were excluded.

Comparison conditions included “intervention-as-usual,” “intervention-as-unusual (i.e., adapted versions),” alternative interventions (e.g., a combination of the different interventions) or control condition. This review focused on interventions with the following outcome categories: GPA and course grade, immediate performance tasks (e.g., word puzzle, number activity, math test, verbal test, GRE-like tests, mental rotation task) and psychological measures (e.g., self-esteem, sense of belonging).

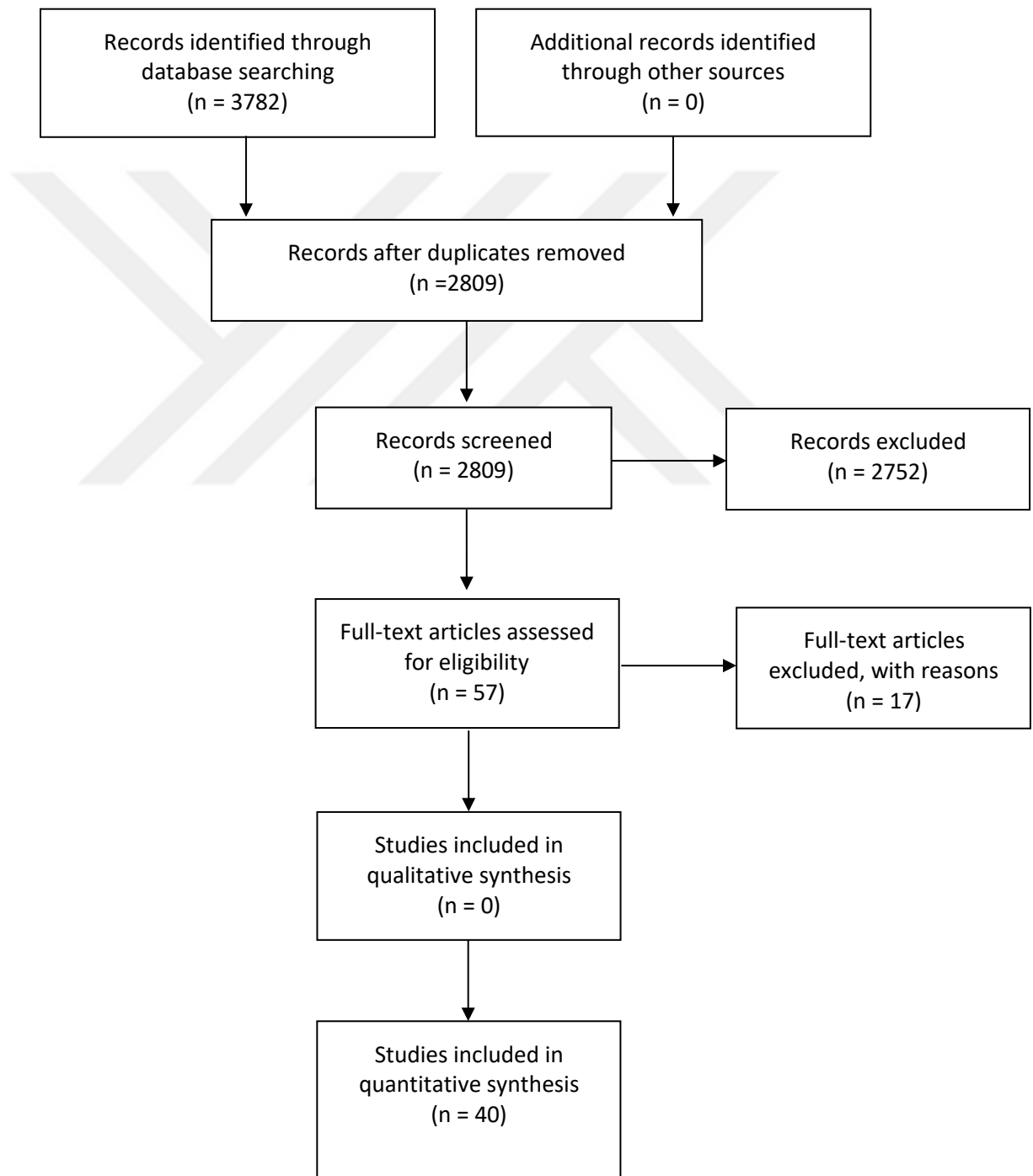
2.3. Data Extraction

In the selection process, a total of 3782 articles were found through the first database search, from which 251 potentially relevant studies were identified and extracted by scanning the article titles. Fifty-seven studies remained after evaluation of the abstracts. Two graduate

research assistants evaluated the full copies of those studies to decide if they met the inclusion criteria or not. Finally, a total number of 40 studies were included in this review (see Figure 1 for the flow chart of the extraction process).

Figure 1

Flow Chart



Extracted data of the included studies comprised following information: bibliographic information (e.g., author, the year of publication), intervention name, purpose of the study (e.g., addressed achievement gap), description of the study sample (e.g., age-group, school grade), measured outcome variables, and study results (e.g., data report). In published and unpublished (e.g., conference presentations) studies, where data were not reported, lead study authors were emailed to acquire the missing information.

2.4. Risk of Bias Assessment

Evaluation of the studies, following the six criteria of the *Cochrane Collaboration Protocol* (Higgins & Green, 2011), involved random sequence generation (i.e., selection bias), blinding of outcome assessment (i.e., detection bias), blinding of participants (i.e., performance bias), selective reporting (i.e., reporting bias), incomplete outcome data (i.e., attrition bias), and other bias (e.g., differences in baseline characteristics, missing comparison group, small intervention groups). Therefore, the risk of bias has been defined as an error that can occur systematically in study inferences or results (e.g., students' assignment to the treatment and control condition is not based on the random allocation). The risk of bias assessment improved our interpretation of the variability in the results (Higgins & Green, 2011). Studies were considered to have a low risk of bias if there was enough information on the requested criterion. If unclear information was given on a criterion, it was described as an unclear risk of bias. High risk of bias consisted of studies where highly biased decisions may have dramatically affected the results of the study.

3. Results

In the initial search, 3782 published and unpublished (e.g., conference presentation) studies were identified, 57 potentially eligible individual studies were scanned, 17 of which were excluded; for instance, if the study is not a randomized trial, the intervention did not explicitly refer to the academic achievement gaps or address gaps other than gender or racial

gap, and the intervention was tested in a domain different than education (e.g., health, organization). The remaining 40 studies were included: Aronson et al., 2002; Baker et al., 2020; Borman et al., 2016; Bosch, 2020; Bowen et al., 2013; Burnette et al., 2020; Broda et al., 2018; Cheryan et al., 2012; Cohen et al., 2006, Study 2; Cohen et al., 2006, Study 1; Cohen et al., 2009; Covarrubias et al., 2016, Study 1; Covarrubias et al., 2016, Study 2; Çetinkaya et al., 2020, Study 1; Dee, 2015; Good et al., 2003; Goyer et al., 2017, Study 1; Goyer et al., 2017, Study 2; Goyer et al., 2019, Study 2; Hanselman et al., 2017; Lokhande & Muller, 2019; Martens et al., 2006, Study 1; Martens et al., 2006, Study 2; Marx & Roman, 2002, Study 1; Marx & Roman, 2002, Study 2; Marx & Roman, 2002, Study 3; Marx et al., 2013; Miyake et al., 2010; Rhee & Johnson, 2019; Sherman et al., 2013, Study 1; Sherman et al., 2013, Study 2; Shnabel et al., 2013, Study 1; Shnabel et al., 2013, Study 2; Walton & Cohen, 2007, Study 2; Walton & Cohen, 2011; Walton et al., 2015; Woolf et al., 2009; Yeager et al., 2016, Study 1; Yeager et al., 2016, Study 2; Yeager et al., 2016, Study 3.

3.1. Study Characteristics

3.1.1. Design and Sample Size

Thirty-nine of the 40 included studies were randomized at the individual level, and one was cluster randomized by tutor (Woolf et al., 2009). Sample sizes ranged between $N=43$ (Marx & Roman, 2002; Study 1) to $N=7,335$ (Yeager et al., 2016; Study 2).

3.1.2. Settings and Participants

The studies took place in five different countries: 36 in the United States, 1 in Canada, 1 in the United Kingdom, 1 in Turkey, and 1 in Germany. Participants were mostly middle school and college students; only one study included high school students (Goyer et al., 2017, Study 1).

3.1.3. Intervention Delivery

Most intervention packages were delivered to students in a school or laboratory environment. Control groups in 33 studies received an intervention different than the treatment group (i.e., interventions that are similar in terms of length and style but different in terms of concern and content, see Walton & Cohen, 2011). Thirty-seven studies used the originally developed interventions with minor additions or changes. Three studies involved adaptations of the values-affirmation intervention (Covarrubias et al., 2016, Studies 1 & 2; Çetinkaya et al., 2020 Study 1).

3.1.4. Outcomes

Included studies measured 25 different intervention outcomes under three different categories: GPA or course grades, task performance, and psychological. GPA or course grade category included cumulative GPA, semester GPA, and social studies grades. Performance tasks included math tests, word puzzle and spatial rotation tasks. Psychological measures included self-esteem, sense of belonging, and self-appraised math ability.

3.2. Results of Individual Studies

Eligible studies involving in the current review were different regarding design, duration, outcome measures, targeted age-group, and targeted achievement gap, showing a great level of heterogeneity, which made us unable to perform a reliable meta-analysis (Glass et al., 1981). Therefore, we provide a summary description of the effects of the interventions (see Table 1). Effect sizes (e.g., Cohen's d , eta squared η^2) were either provided by the study authors or computed using information (mean, standard deviation, and sample size) given by the study authors, and effect sizes that were provided in a different metric than Cohen's d were transformed to Cohen's d .

Table 1*Effectiveness of Brief Social Psychological Interventions*

Study	Intervention	Addressed gap	Age-group	Outcomes measures	Effect size	Summary of Effect
Cohen et al. 2006 (Study 1)	Values-Affirmation	Racial gap	Middle School	Fall Term Grades (GPA)	Medium ($d = .52$) [±]	Medium effect of values-affirmation intervention compared to control.
Cohen et al. 2006 (Study 2)	Values-Affirmation	Racial gap	Middle School	Fall Term Grades (GPA)	Medium ($d = .68$) ^{±±}	Medium effect of values-affirmation intervention compared to control
Sherman et al. 2013 (Study 1)	Values-Affirmation	Racial gap	Middle School	GPA over time	Small ($d = .24$) [±]	Small effect of values-affirmation intervention compared to control.
Sherman et al. 2013 (Study 2)	Values-Affirmation	Racial gap	Middle School	GPA over time	Medium ($d = .56$) [±]	Medium effect of values-affirmation intervention compared to control.
Bowen et al. 2013	Values-Affirmation	Racial gap	Middle School	Social studies grades	Medium ($d = .57$)	Medium effect of values-affirmation intervention compared to control.
Cohen et al. 2009	Values-Affirmation	Racial gap	Middle School	GPA	Small ($d = .48$)	Small effect of values-affirmation intervention compared to control.
Covarrubias et al. 2016 (Study 1)	Values-Affirmation	Racial gap	Middle School	Number Activity	Large ($d = .88$) [±]	Large effect of interdependent affirmation intervention compared to independent affirmation intervention.
					Small ($d = .19$) [±]	Small effect of interdependent affirmation to control group.

Table 1 (*continued*)

Shnabel et al. 2013 (Study 1)	Values-Affirmation	Racial gap	Middle School	GPA	Medium ($d=.61$)	Medium effect of values-affirmation intervention compared to control.
Dee 2015	Values-Affirmation	Racial gap	Middle School	Final Course Grade	No effect ($d = .02$) [±] Small ($d = -.36$) [±]	No effect of values-affirmation intervention compared to control for minorities. Small reverse effect of affirmation intervention compared to control for female students.
Hanselman et al. 2017	Values-Affirmation	Racial gap	Middle School	GPA	Small ($d = .15$) [±] No effect ($d = -.07$) [±]	Small effect of affirmation intervention compared to control for Cohort 1. No effect of affirmation intervention compared to control for Cohort 2.
Borman et al. 2016	Values-Affirmation	Racial gap	Middle School	GPA	No effect ($d = .09$) [±]	No effect of values-affirmation intervention compared to control.
Lokhande and Muller, 2019	Values-Affirmation	Gender and minority gap	Middle School	Math score	Small (Wave 1; $d = .11$) [±] Small (Wave 2; $d = .17$) [±]	Small effect of values-affirmation intervention compared to control for wave 1. Small effect of values-affirmation intervention compared to control for wave 2.
Goyer et al. 2017 (Study 1)	Values-Affirmation	Racial gap	High School	Course difficulty	Small ($d = .48$) [±]	Small effect of values-affirmation intervention compared to control.

Table 1 (*continued*)

Baker et al. 2020	Values-Affirmation	Racial gap	College	GPA	Small ($d = .40$) ^{± ±}	Small effect of values affirmation intervention compared to control.
Covarrubias et al. 2016 (Study 2)	Values-Affirmation	Racial gap	College	Word puzzle	Large ($d = .96$) [±] Medium ($d = .73$) [±]	Large effect of interdependent affirmation intervention compared to independent affirmation. Medium effect of interdependent affirmation intervention compared to control condition.
Goyer et al. 2017 (Study 2)	Values-Affirmation	Racial gap	College	4-year college selectivity	Medium ($d = .49$)	Medium effect of values-affirmation intervention compared to control.
Woolf et al. 2009	Values-Affirmation	Racial gap	College	Summative written assessment, OSCE	No effect ($d = .07$) Small ($d = .29$)	No effect of values-affirmation intervention compared to control Small effect of values-affirmation intervention compared to control.
Çetinkaya et al. 2020 (Study 1)	Values-Affirmation	Gender gap	College	Mental Rotation Task	Large ($d = .79$) [±]	Large effect of values-affirmation intervention compared to control.
Martens et al. 2006 (Study 1)	Values-Affirmation	Gender gap	College	Math Test (GMAT)	-	No data reported.
Miyake et al. 2010	Values-Affirmation	Gender gap	College	Scores on Class Exam	Small ($d = .18$) [±]	Small effect of values-affirmation intervention compared to control.

Table 1 (*continued*)

Bosch 2020	Values-Affirmation	Gender gap	College	Pre-calculus Exam Scores	-	No data reported.
Walton et al. 2015	Values-Affirmation	Gender gap	College	GPA	Large ($d = 1.02$) [±]	Large effect of affirmation-training intervention compared to control.
Shnabel et al. 2013 (Study 2)	Values-Affirmation	Gender gap	College	Math Test	Large ($\eta^2=.35$, $d = 1.46$) [±]	Large effect of belonging-affirmation intervention on women's and men's math performance.
Cheryan et al. 2012	Role Model	Gender gap	College	Computer Science Interest	Large ($d = .84$) [±]	Large effect of stereotypical female role sense of belonging model compared to non-stereotypical male role model on women's interest in computer science.
Marx and Roman 2002 (Study 1)	Role Model	Gender gap	College	Math test	Medium ($d = 0.62$) ^{±±}	Medium effect of female experimenter role model on women's and men's math scores.
				State self-esteem	Large ($d = 0.87$) ^{±±}	Large effect of female experimenter role model on women's and men's state self-esteem scores.
Marx and Roman 2002 (Study 1)	Role Model	Gender gap	College	Math test	Large ($d = 1.43$) ^{±±}	Large effect of highly competent female experimenter on women's math test scores compared to lowly competent female experimenter.

Table 1 (*continued*)

Marx and Roman 2002 (Study 3)	Role Model	Gender gap	College	Math test	Large ($d = 1.92$) ^{±±}	Large effect of high math competence female role model compared to low math competence female role model on women's math test scores.
				Self-appraised math ability	Large ($d = 1.46$) ^{±±}	Large effect of high math competence female role model compared to low math competence female role model on women's self-appraised math ability scores.
Marx et al. 2013	Role Model	Gender gap	College	Math test	Small ($d = 0.35$) ^{±±}	Small effect of typical female role model on female participants' math performance compared to the doubtful female role model.
Good et al. 2003	Growth-Mindset	Racial and gender gap	Middle School	Standardized test scores, reading achievement test scores	Large (Incremental cond. vs control; $d = 1.13$, $d = .52$) [±]	Large effect of incremental, intervention compared to control.
					Large (Attribution cond. vs control; $d = 1.50$, $d = .71$) [±]	Large effect of attribution intervention compared to control.
					Large (Combination cond. vs control; $d = 1.30$) [±]	Large effect of combined (incremental + attribution) intervention compared to control.
Aronson et al. 2002	Growth-Mindset	Racial gap	College	GPA	-	No data reported.

Table 1 (*continued*)

Rhee and Johnson 2019	Growth-Mindset	Minority gap	College	Cumulative GPA	-	No data reported.
Burnette et al. 2020	Growth-Mindset	Gender gap	College	Final Grade	No effect ($d = .07$) [±]	No effect of growth mindset intervention compared to control.
Goyer et al. 2019 (Study 2)	Social belonging	Racial gap	Middle School	Social belonging over middle school	Large ($d = .95$) [±]	Large effect of social-belonging intervention compared to control.
Walton and Cohen 2007 (Study 2)	Social belonging	Racial gap	College	GPA	Large ($d = 1.10$) [±]	Large effect of social-belonging intervention compared to control.
Walton and Cohen 2011	Social belonging	Racial gap	College	3-Years GPA	Medium ($d = .60$)	Medium effect of social belonging intervention compared to control.
Rhee and Johnson 2019	Social belonging	Minority gap	College	Cumulative GPA	-	No data reported.
Broda et al. 2018	Growth-Mindset and social belonging (Lay theories)	Racial gap	College	Cumulative GPA	Medium ($d = .42$) [±] No effect ($d = .0002$) [±]	Medium effect of growth mindset intervention compared to control for Latino students. No effect of growth mindset intervention compared to control condition for African American students.
Yeager et al. 2016 (Study 1)	Lay theory intervention	Racial and ethnic, gap	College	Full-time enrolment	Small ($d = .35$) ^{±±}	Small effect of social belonging lay theory intervention compared to control.

Table 1 (*continued*)

Yeager et al. 2016 (Study 2)	Lay theory intervention	Racial and ethnic gap	College	Full-time enrolment	Small ($d=.11$) ^{±±}	Small effect of lay theory intervention compared to control.
Yeager et al. 2016 (Study 3)	Lay theory intervention	Racial and ethnic gap	College	First year GPA	Small ($d=.25$) [±]	Small effect of lay theory intervention compared to control.

Notes. [±] Cohen's d calculated by study authors, ^{±±} Given effect size converted to Cohen's d , “-” indicates data were not provided.

3.2.1. Values Affirmation Intervention

Two studies (Shnabel et al., 2013, Study 1 & 2) evaluated the effectiveness of values affirmation intervention compared to a control condition with regard to minority achievement gap in middle school students, and the gender achievement gap in college students and reported moderate to large effects ($d = .61$ and $d = 1.46$ respectively). One study (Lokhande & Muller 2019) reported both short and long-term positive but small effects of the intervention on math competence ($d = .20$ and $d = .18$ respectively) for students who are in “double jeopardy”, female and minority middle-school students, compared to control. Eleven studies compared values affirmation group to either control condition or “treatment-as-unusual” groups (e.g., Covarrubias et al., 2016, Study 1) regarding minority and gender achievement gaps in middle school students. Most of these studies used GPA as the outcome. Eight of these studies (Cohen et al., 2006, Study 1 & 2; Sherman et al., 2013, Study 1; Sherman et al., 2013, Study 2; Bowen et al., 2013, Cohen et al., 2009, Covarrubias et al., 2016, Study 1; Borman et al., 2016) reported positive effects of the intervention on GPA and course grade (effect sizes ranged between .09 and .88); however, four studies (Baker et al., 2020; Bosch, 2020; Dee, 2015; Hanselman et al., 2017) failed to replicate these positive findings. Only one study evaluated the effectiveness of the values affirmation intervention in high school students (Goyer et al., 2017, Study 1). The study addressed the minority achievement gap and reported medium gains as compared to the control group ($d = .48$). Eight studies (Çetinkaya et al., 2020, Study 1; Covarrubias et al., 2016, Study 2; Goyer et al., 2017, Study 2; Woolf et al., 2009; Martens et al., 2006, Study 1; Martens et al., 2006, Study 2; Miyake et al., 2010; Walton et al., 2015) evaluated the effect of values affirmation intervention, compared to either control condition or treatment-as-unusual, (Çetinkaya et al., 2020, Study 1; Covarrubias et al., 2016, Study 2) to reduce minority and gender achievement gaps in college students. Effect sizes were provided by study authors for four studies (Çetinkaya et al., 2020,

Study 1; Covarrubias et al., 2016, Study 2; Goyer et al., 2017, Study 2; Miyake et al., 2010) and could be calculated by us for one study (Woolf et al., 2009) and ranged from .07 (no effect) to 1.02 (large).

3.2.2. *Role Model Intervention*

All five studies (Cheryan et al., 2012; Marx & Roman, 2002, Study 1; Marx & Roman, Study 2; Marx & Roman, 2002, Study 3; Marx et al., 2013) evaluating the effectiveness of the role model intervention addressed gender achievement gap in college students. All studies reported positive effects of intervention for performance and psychological measures (e.g., sense of belonging, self-esteem). Effect sizes were provided by study authors and ranged from .35 (small) to 1.92 (large).

3.2.3. *Theories of Intelligence (Growth Mindset) Intervention*

One study (Good et al., 2003) evaluated the effect of intervention compared to alternative treatments and control condition in terms of minority and gender achievement gap in middle school students. The result of this study was positive, in favour of growth mindset and alternative interventions (i.e., attribution and incremental plus attribution conditions), compared to control, and effect sizes ranged between .52 (medium) and 1.50 (large). Another study (Broda et al., 2018) assessed the effect of growth mindset intervention compared to the control condition to reduce minority achievement gap in college students. They reported that Latino students who received the growth mindset intervention had a higher cumulative GPA compared to the control group ($d = .42$), however, no effect was found for the African American students in the growth mindset condition compared to control group ($d = .00$). Three studies (Burnette et al., 2020; Rhee & Johnson, 2019; Yeager et al., 2016, Study 1) were not able to report the positive effect of growth mindset intervention compared to the control condition. Burnette et al., (2020) reported that the growth mindset intervention failed to predict students' final grades ($d = .07$), but enhanced students' computer science related

career interest compared to the control condition ($d = .23$). Rhee & Johnson, (2019) found no significant impact of growth mindset intervention on cumulative GPA in specific student subgroups (URM, female, and Pell-eligible students). Similarly, Yeager et al. (2016, Study 1) found that the growth mindset intervention was not effective in changing students' full-time enrolment rates.

3.2.4. *Social-Belonging Intervention*

Two studies (Walton & Cohen, 2007, Study 2; Walton & Cohen, 2011) assessed the effect of social-belonging interventions compared to control conditions in terms of the minority achievement gap in college students, and they reported positive effects of social-belonging interventions in increasing both GPA and the math test performance. Effect sizes ranged between .60 (medium) to 1.46 (large). One study (Goyer et al., 2019, Study 2) tested the effect of a social belonging intervention on social psychological outcomes (i.e., belonging uncertainty, stereotype threat, and social belonging) with the aim of reducing the racial achievement gap in middle school students. Effect sizes ranged from .78 (medium) to .95 (large). One study (Walton et al., 2015) assessed the effectiveness of the social-belonging intervention compared to alternative treatment (i.e., affirmation-training) and control condition and targeted to reduce the gender achievement gap in college students. A positive and large effect of the social belonging intervention was reported compared to control condition ($d = 1.07$) in raising the first-year engineering-courses GPA of college students. Additionally, a large effect of the combined intervention (i.e., social belonging plus affirmation training) was reported by the study author over control condition ($d = 1.04$). Three studies (Yeager et al., 2016, Study 1, 2, & 3) tested the effectiveness of lay theory interventions compared to control condition, addressing disadvantaged achievement gap in college students, using full time enrolment (Study 1 & 2) and first year GPA (Study 3) as a primary outcome. A positive effect of the social belonging intervention was reported

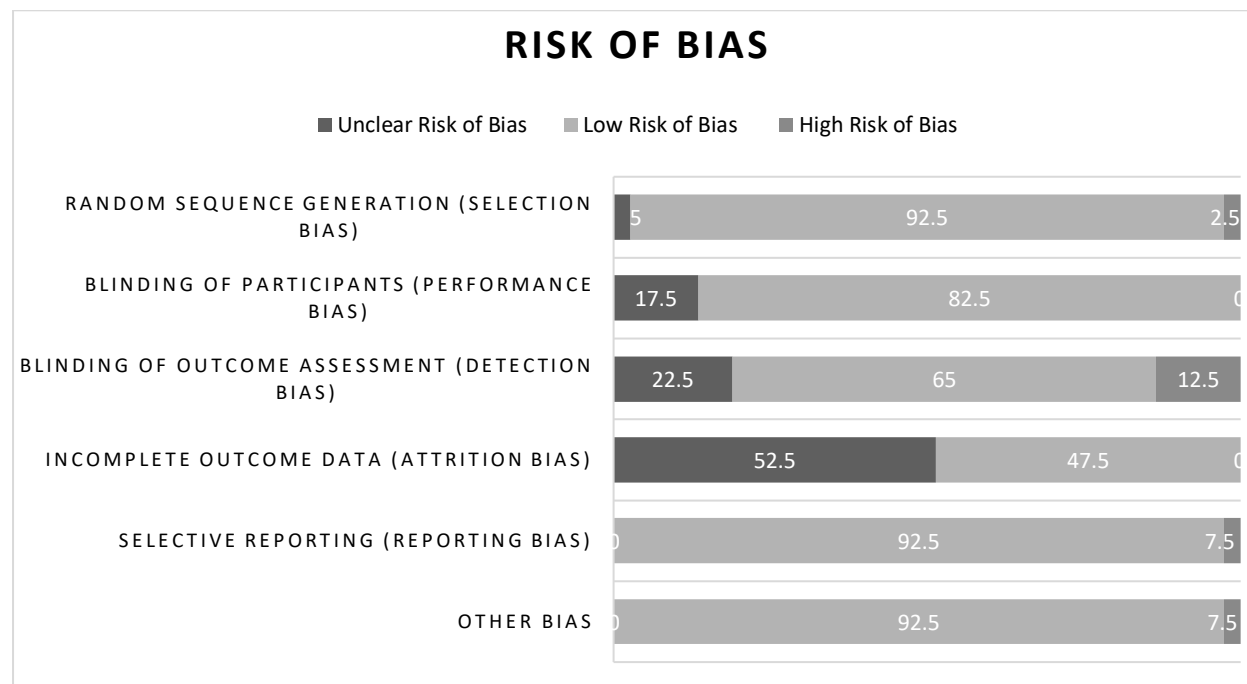
compared to the control condition among urban charter graduates (Yeager et al., 2016, Study 1, $d = .35$). Lay theory interventions increased the disadvantaged students' full-time enrolment compared to control group over the first year in a public university (Yeager et al., 2016, Study 2, $d = .11$). Lay theory interventions (i.e., social belonging, cultural fit, critical feedback) independently increased first year GPA of the intervention group compared to control condition in a selective university (Yeager et al., 2016, Study 3, $d = .25$). One study addressing minority achievement gap (Broda et al., 2018) did not report such a positive effect of the social belonging intervention on cumulative GPA, compared to control condition (Latino students, $d = .11$; African American students, $d = .06$). Similarly, another study (Rhee & Johnson, 2019) targeting minority and gender achievement gap was not able to report a positive effect of social belonging intervention. Rhee and Johnson (2019) found no significant impact of social belonging intervention on cumulative GPA in specific student subgroups (URM, female and Pell-eligible students).

3.3. Risk of Bias Across Studies

The evaluation of the *risk of bias* of the studies (Figure 2) revealed that less than half of the studies (10 studies, 25%) showed at least one field with high risk of bias. Thirteen studies showed a low risk of bias (32.5%), means that they did not showed any biases, and 19 studies demonstrated a minimum of one field with an unclear risk of bias (47.5%). The majority of studies (37 studies, 92.5%) indicated a low risk in terms of reporting and other biases. The risk for criteria selection bias (e.g., differences in baseline characteristics, missing comparison group, small size intervention group) was low in most of the studies (92.5%). Most of the studies either did not provide sufficient information on attrition bias (incomplete outcome data: 52.5%) or revealed a low risk of bias (47.5%). Five studies revealed high risk (12.5%) and nine studies showed an unclear risk (22.5%) for detection bias, however, more than half of the studies were free from detection bias (26 studies; 65%).

Figure 2

Summary of the Risk of Bias (in Percentages)



Note. Random Sequence Generation (Selection bias): Unclear risk of bias: 5%, Low risk of bias: 92.5%, High risk of bias: 2.5%; Blinding of Participants (Performance bias): Unclear risk of bias: 17.5%, Low risk of bias: 82.5%, High risk of bias: 0%; Blinding of Outcome Assessment (Detection bias): Unclear risk of bias: 22.5%, Low risk of bias: 65%, High risk of bias: 12.5%; Incomplete Outcome Data (Attrition bias): Unclear risk of bias: 52.5%, Low risk of bias: 47.5%, High risk of bias: 0%; Selective Reporting (Reporting bias): Unclear risk of bias: 0%, Low risk of bias: 92.5%, High risk of bias: 7.5%; Other bias: Unclear risk of bias: 0%, Low risk of bias: 92.5%, High risk of bias: 7.5%).

4. Discussion and Conclusions

In this review, we analysed the results of 40 studies on brief social psychological interventions aimed at reducing gender or ethnic academic achievement gaps. Four different types of BSPIs (e.g., values affirmation, role model, theories of intelligence, and social belonging) have been tested with regards to their ability on improving academic, task performance, or psychological outcomes. Most of the reviewed studies (22 out of 28) reported results favouring the intervention group on academic performance (course grade and GPA), performance tasks (e.g., word puzzles, number activities, math tests, verbal tests, GRE-like tests, mental rotation tasks), and psychological measures such as self-esteem and

sense of belonging. Although the effect sizes varied in magnitude, the evidence suggests that BSPIs are promising for alleviating the negative consequences of stereotype threat or belonging uncertainty in vulnerable populations and for improving student outcomes.

Studies including values affirmation interventions aimed at decreasing the achievement gap were able to successfully increase the grade related outcome category. Positive effects were found for 9 studies (out of 12) in the enhancement of the course grade and GPA (including enhancement over time for some studies). However, four studies (Baker et al., 2020; Bosch, 2020; Dee, 2015; Hanselman et al., 2017) did not replicate the positive effect of a values affirmation intervention; in fact, there was no effect on minority students' performances and even an adverse effect on female students' final course grade (Dee, 2015). Several possible explanations were suggested regarding the null results of the values affirmation intervention in these studies. However, the most obvious explanation could be that the positive impact of values affirmation intervention does not replicate in some settings. The intervention design per se may have led to null findings. Specifically, when students were asked to list their most and least important values, the affirmation and control exercises may not have prompted different mechanisms to produce a treatment effect (Dee, 2015; Baker et al., 2020). Moreover, the adverse effect of the values affirmation intervention among female students may suggest that middle-school female students' performance is not affected by the stereotype threat (Dee, 2015). Dee (2015) argued that the affirmation and the control condition used in this study may trigger some different processes that are apparent for middle-school female students, but not for others. Four studies (out of 6) which included performance tasks (e.g., GMAT, mental rotation task) as an outcome variable were able to achieve positive results of values affirmation intervention. Only one study (Goyer et al., 2017, Study 2) used psychological measures as a primary outcome variable and reported positive results on the effectiveness of values affirmation intervention targeting the racial

achievement gap among college students. Although the negative effect of values affirmation suggests that these interventions have occasionally backfired, yet it triggers direct and indirect implications for different age groups and achievement gaps.

The results of two studies using values affirmation intervention suggest that reminding stigmatized individuals of their meaningful social connections enhances their ability to perform competently when facing identity threat (Shnabel et al., 2013, Study 1 & 2). The findings of these two studies not only reveal the importance of social-belonging (i.e., having meaningful social bonds) per se but also advance the understanding of the theoretical construct and processes of values affirmation intervention in general. Presently, values affirmation is known as a content-free psychological process, however, it has been demonstrated that writing about the social-belonging theme can be a very important part of the effectiveness of values affirmation intervention at increasing performance among negatively stigmatized groups (e.g., African American middle school students, female college students; Shnabel et al., 2013, Study 1 & 2).

It is also important to note that the adaptation of the original values affirmation intervention has yielded a large effect for both gender and minority achievement gaps, which raises a requirement in values affirmation research to consider the content of students' writings, as this content can diversify by gender and cultural group. More specifically, the adaptation of self-affirmation, namely group-affirmation, enhanced female college students' immediate performance (i.e., on a mental rotation task) after being exposed to group threat, which is promising on closing the gender achievement gap (Çetinkaya et al., 2020, Study 1). Moreover, students from an interdependent cultural background (e.g., Latino) performed better when the content of the affirmation intervention matched with their cultural background, regardless of age-group, which may ultimately contribute to closing the minority achievement gap (Covarrubias et al., 2016, Studies 1 & 2). Therefore, specifically tailored,

individually and contextually adapted interventions will be ultimately more successful than a “one model fits all” approach (Cohen & Garcia, 2014).

Four studies (out of 5) including role model interventions targeted to reduce the gender achievement gap were able to successfully improve college students’ either immediate performance (e.g., math test) or psychological status (e.g., sense of belonging, self-esteem). However, findings regarding the effectiveness of the role model intervention suggest some boundary conditions for when female college students benefit from role model exposure (Cheryan et al., 2012; Marx & Roman, 2002, Study 1, 2 & 3; Marx et al., 2013). Specifically, to optimally buffer female students’ performance under threat, female role models need to show no doubt, incompetency, and stereotypical characteristics about their abilities or how people will see them. Expressions of doubt, incompetency, and stereotypical properties of an in-group role model undermine female college students’ performances and increase the gender achievement gap, since it may directly prompt female students about their incompetencies and negative stereotypes associated with their gender group.

Studies aimed at reducing achievement gap through a growth-mindset intervention were able to improve minority middle school students’ educational outcomes (e.g., standardized test performance, cumulative GPA), yet not all groups of minority students (e.g., African American students in Broda et al., 2018) have benefited equally from the mindset intervention. This raises an important question of why growth mindset interventions may have varying effects on students from different minority groups. This heterogeneous effect of mindset intervention can be related to students’ pre-treatment level of growth mindset intervention. Broda et al. (2018) found that the initial level of growth mindset significantly and negatively moderates the effect of growth mindset intervention for African American students but not Latino students, suggesting that prior intervention had a heterogeneous treatment effect on African American students, and this probably explains why the growth

mindset intervention may have different effects on students from different minority backgrounds. The positive effect of a growth mindset could not be shown over the control condition in three studies (Burnette et al., 2020; Rhee & Johnson, 2019; Yeager et al., 2016, Study 1). It has been suggested that the materials and messages similar to the growth mindset intervention administered by the school in that study may dampen the effect of the growth mindset intervention (Yeager et al., 2016, Study 1). Additionally, only one study (Good et al., 2003) which included combination treatment wherein students were exposed to both incremental theory of mind and attributional messages, accomplished large gains in test scores. This suggests that combined interventions which addressed the similar underlying concern led to higher test scores and helped more.

Positive results were also achieved in the studies targeted to mitigate belonging uncertainty through a social-belonging intervention (Walton & Cohen, 2007; 2011; Broda et al., 2018; Yeager et al., 2016, Study 1, 2, & 3; Goyer et al., 2019). In contrast, in two studies (Broda et al., 2018, Rhee & Johnson, 2019), there were no positive effects of the social belonging intervention on any outcome measures. These inconsistent results may address the need for customization of the interventions in which the effectiveness of any social psychological interventions may depend on how well an intervention is modified to suit a particular group to meet the needs of different groups and the contexts (Yeager & Walton, 2011). Social belonging intervention as a tool to minimize the detrimental effect of belonging uncertainty on students' educational outcomes likely needs to be calibrated to properly address the social drawbacks encountered by a particular group of students.

4.1. Limitations and Recommendations for Future Studies

There are several limitations of the current review. First, the wide variety of terms for brief social psychological interventions (e.g., wise interventions, identity safety interventions) caused difficulties for the literature search, yet we tried to access unpublished works through

comprehensive literature review and emailing authors. Second, authors of five included studies were e-mailed for more information but could not be contacted. Third, non-English databases were not searched; therefore, it was not possible to identify any relevant non-English studies.

The unique challenges and unexplained heterogeneity results (Baker et al., 2020; Dee, 2015; Hanselman et al., 2017, Broda et al., 2018) for BSPIs refer to some practical limitations of those interventions to close achievement gaps and call for better consideration of the necessary moderators which may influence the effectiveness of brief social psychological interventions in applied settings. Although the findings of some studies (Baker et al., 2020; Dee, 2015; Hanselman et al., 2017; Broda et al., 2018) showed unexpected and adverse results contrary to large positive effects found in the original studies (Cohen et al., 2006; Good et al., 2003), they reported some evidence with regard to moderators of treatment effect, such as classroom size and the pre-treatment level of growth mindset. Therefore, future research is needed to investigate potential moderators which may contribute to the effectiveness of brief social psychological interventions.

This review points out to the need for testing of brief social psychological interventions in different contexts. Many of the reviewed studies implemented the interventions in the Western culture and Social and cultural norms and values associated with gender and minority practices are all likely to influence the acceptability, suitability, adaptableness, and effectiveness of these interventions when transported to different countries. Thus, future studies should focus on testing these interventions and their adapted versions in different cultural settings.

BSPIs target different motivational processes. As a result, they are not able to produce the same positive impact all the time. The temporal and situational circumstances influence the interventions' effects. Indeed, these interventions may be tailored, adjusted, and

customized for a particular group in a particular context to ensure they bring the greatest impact. For instance, values affirmation can be highly effective for minority students when it is matched with their cultural background (Covarrubias et al., 2016, Study 1 & 2). Thus, future work should test the adapted versions of these interventions which may require additional modification and innovation, rather than simply delivering the original content without thinking if the desired message will be seized upon. Manuals (e.g., Walton et al., 2017) on how to customize the interventions would greatly contribute to such research as well.

Finally, different brief interventions can be combined, when possible, to obtain optimized results in closing achievement gaps. In values affirmation exercises, for example, writing about social-belonging themes as well can enhance the effectiveness of affirmation intervention at increasing achievement among negatively stigmatized groups (Shnabel et al., 2013, Studies 1 & 2). Future studies should also test if a combination of the different approaches results in better short- and long-term outcomes for some groups to reduce the pernicious impact of stereotype threat (Good et al., 2003).

CHAPTER 3
ADAPTING THE VALUES AFFIRMATION INTERVENTION
TO A MULTI-STEREOTYPE THREAT FRAMEWORK FOR FEMALE STUDENTS
IN STEM

Çetinkaya, E., Herrmann, S. D., & Kisbu-Sakarya, Y. (2020). Adapting the values affirmation intervention to a multi-stereotype threat framework for female students in STEM. *Social Psychology of Education*, 23, 1587–1607.

Abstract

We examined if an adapted version of a brief social psychological intervention following a multi-threat framework can enhance the mental task performance of female college students under stereotype threat. In experiment 1, under self-as-target stereotype threat, as expected, students who were exposed to the self-affirmation intervention had the highest task performance. However, under group-as-target stereotype threat, we found similar performances of the students in both the self-affirmation and group-affirmation conditions compared to control condition. In experiment 2, we showed that the extent a female student is identified with her gender group moderates the effectiveness of the group-affirmation intervention. The current research encourages researchers to consider different understandings of self while instituting common stereotype threat interventions rather than taking a uniform approach.

Keywords: Stereotype threat, Values affirmation, Gender gap, Self-affirmation, Gender identification, STEM

1. Introduction

Female students in STEM (science, technology, engineering, and mathematics) are more likely to drop out of school compared to male students, get lower exam grades in courses such as physics and perform worse than male students in quantitative tests, especially in settings characterized by gender biases (Strenta, Elliott, Adair, Matier, and Scott 1994; Pollock, Finkelstein, and Kost 2007; Steele, Spencer, and Aronson 2002; Van Camp, Gibert, and O'Brien 2019). Even though structural factors contribute to these discrepancies, psychological processes such as stereotype relevant worries have also been suggested as playing a significant role (Walton and Spencer 2009). Stereotype threat research demonstrated that a concern that one's actions can be viewed through the lens of a negative stereotype may undermine performance in a negatively stereotyped domain (Steele and Aronson 1995). In support of the stereotype threat explanation, a large body of studies have demonstrated that the salience of negative stereotypes about one's identity group systematically impact performance on evaluative tasks in a given context (Appel and Kronberger 2012; Steele and Aronson 1995; Steele 1997; Aronson, Lustina, Good, Keough, and Steele et al. 1999; Sherbaum, Blanshety, Marshall-Wolp, McCue, and Strauss 2011). For example, experimental studies have shown that even though female and male students had similar performance on an intermediate level math test, in the case of more advanced problems, female students performed worse than their male counterparts (Gallagher et al. 2000; Kimball 1989). Similarly, Spencer, Steele and Quinn (1999) found that women and men performed similarly when the gender differences regarding performance on a challenging math test were not emphasized. However, when women were told that test result had shown gender disparities in the past, they performed worse than men. Good, Aronson, and Harder (2008) showed the detrimental effect of stereotype threat even among female students who are highly motivated and proficient in math. They found that female students in

the stereotype nullifying condition outperformed the male students in a calculus class.

However, when the test was given under a no-threat condition, male and female students performed equally well.

What are the main reasons for the attenuation of performance of the female students in stereotype threatening situations? As described above, stereotype threat is an interruptive concern; however, it does not necessarily reduce motivation in evaluative situations. Instead, it may increase the will to perform well on a given task and confute the negative stereotype about one's ingroup (Steele and Aronson 1995). Moreover, it has been revealed that participants are actually increasing their exert in a situation characterized by stereotype threat (Jamieson and Harkins 2007; 2009; 2011; Moè, Meneghetti, and Cadinu 2009). Nevertheless, more effort does not necessarily mean better performance. Whenever a negative stereotype becomes salient, the motivation to do well generates distractions in one's thoughts. Students focus on the self-evaluative implication of the task rather than the academic experience. This, in turn, reduces female students' performance results due to the threat of confirming the negative stereotype about their ingroup (see Smith and Hung 2008; Schmader et al. 2008). In further support to this claim, it has been shown that women who were exposed to stereotype threat reported more negative math-related thoughts, compared to women who were not (Cadinu, Maass, Rosabianca, and Kiesner 2005). Furthermore, the difference between the content of thoughts for stereotyped women has been evaluated as the indication of the lower performance. It has been suggested that in stereotype threatening situations, disruptive thoughts retain the executive resources of female students, which are required to accomplish cognitively demanding tasks and thus undermine their academic outcomes (Beilock, Rydell, and McConnell 2007; Johns, Inzlicht, and Schmader 2008; Rydell, McConnell, and Beilock 2009; Schmader et al. 2008; Schmader and Johns 2003).

Stereotype threat is situational in nature. Hence, a substantive number of interventions that are believed to be successful in eliminating these situational barriers, thereby buffering against the detrimental effect of stereotype threat (Spitzer and Aronson 2015). *Values affirmation* is one of the well-known brief social psychological interventions which received empirical support for closing achievement gaps (e.g., gender, minority) and yielding large impact as a stereotype threat intervention (Cohen, Garcia, Apfel and Master 2006; Cohen, Garcia, Purdie-Vaughns, Apfel, and Brzustoski 2009; Martens, Johns, Greenberg, and Schimel 2006; Miyake, Kost-Smith, Finkelstein, Pollock, and Cohen 2010). This paper, using a multi-threat framework, aims to test whether (1) the values affirmation intervention works under different stereotype threats (i.e., self-as-target threat and group-as-target threat); (2) a modified version of the values affirmation intervention is better in protecting the participants against the group-as-target threat; and (3) these different versions of the values affirmation intervention are differentially effective for female participants who have high or low gender identification.

1.1 Values Affirmation as a Stereotype Threat Intervention

Self-affirmation theory posits that people are driven to preserve the perceived self-worth and self-integrity, and a global sense of adequacy (Steele 1988). Central to affirmation theory is that self-system is dynamic, and people can mobilize the psychological resources when the global adequacy and self-integrity is in the question. Values affirmation, through affirming important values unrelated to the provoking threat, invites individuals to reflect upon and express main aspects of the self and can restore their global self-view in response to a threat (see Croizet, Désert, Dutrévis, and Leyens 2001).

In a standard induction of affirmation, people write about important values (e.g., religion, creativity, and relationship with family and friends) in which they engage in an activity that distinguishes these crucial values from the threatening domain (Steele 1988). In

practice, students in the values affirmation condition are presented with a list of values, asked to select the most important value for themselves, and write about why this value is important to them by providing examples. In the control condition, they are presented with the same list of value but asked to select the least important value for themselves and write about why this value might be important to someone else (Cohen et al. 2006; Covarrubias, Herrmann, and Fryberg 2016; Martens et al. 2006; Miyake et al. 2010). Variations have shown that interdependent framing of these values affirmations (e.g., values important to me and my family) are beneficial for students from traditionally interdependent cultural contexts (Cai, Sedikides, and Jiang, 2012; Covarrubias et al. 2016). Key to these manipulations is that they are self-generated and allow individuals to reflect the standards they use to evaluate their global self-view, resulting in more adaptive reactions to threats (Sherman 2013).

As previously mentioned, stereotype threat is a steady source of academic underperformance when one's social group—such as a gender group—is devalued. Values affirmation interventions can make threats, such as concerns about being intellectually inferior, less psychologically disruptive by expanding the bases of self-worth prominent at times of these threats (Steele 1988). This, in turn, enables underrepresented students to focus on the academic tasks, rather than self-evaluative implications of the tasks at hand.

Studies using values-affirmation intervention have found that these brief but substantive acts of writing about one's important values protect against psychological stress of stereotype threat (Sherman, Bunyan, Creswell, and Jaremka 2009) and in turn improve academic performance of female students (Martens et al. 2006; Miyake et al. 2010; Shapiro, Williams and Hambarchyan 2013). For example, Martens et al. (2006) investigated the effects of self-affirmation on the task performance of women under stereotype threat. Women college students were first randomly assigned to one of two stereotype threat conditions in which a difficult math test was described as either diagnostic (stereotype threat) or non-

diagnostic (no threat control condition) of math intelligence. Furthermore, women were randomly assigned either to self-affirmation condition or control condition. They found that women performed more poorly on a difficult math test when it was described as diagnostic of math intelligence compared to when it was described as non-diagnostic. However, when women under stereotype threat affirmed a value (different from math), they performed at levels comparable to women in no threat control condition. Research on women in a college-level introductory class also showed that values affirmation significantly reduced the gender performance gap and elevated women's grades from the C to B range (Miyake et al. 2010). These findings suggest that engaging in a values affirmation task protected female students' outcomes against the detrimental effects of negative stereotype threats.

1.2 Adapting the Values Affirmation Intervention to Different Stereotype Threats

The studies reviewed above demonstrate that stereotype threat has been conceptualized and mostly treated as a single construct by many researchers, such that it is believed that stereotype threat is experienced similarly across individuals, groups, and situations. However, the *Multi-Threat Framework* (Shapiro and Neuberg 2007; Shapiro 2011; Shapiro et al. 2013) emphasized the importance of multiple and qualitatively distinct stereotype threats and outlined six different stereotype threats that arise from an evaluation of two dimensions: (1) the target of the stereotype threat (i.e., the self or the group) and (2) the source of the stereotype threat (i.e., the self, outgroup others or ingroup others). From the perspective of the target of stereotype threat dimension, in a typical stereotype relevant situations one can either worry about the way the performance will reflect upon the abilities of one's group (i.e., group-as-target stereotype threats) or one's personal ability and capacity (i.e., self-as-target stereotype threats; Shapiro and Neuberg 2007; Shapiro 2011; Shapiro and Williams 2011; Shapiro et al. 2013). Indeed, *the group* can be targeted by the stereotype threat, in which concern centers on whether one's performance reflects on the abilities of one's group,

thereby expressing whether the stereotype about that particular group is true either in one's own eyes or in the eyes of others. *Self* also can be targeted by the stereotype threat. That is, when the stereotypical situations become salient, one may also fear to be a stereotypic member of the particular group (e.g., either in one's own eyes or in the eyes of others) with performance as the potential representation of one's own personal abilities (Shapiro et al. 2013). In many studies, stereotype threat is conceptualized either as a concern reflecting on group abilities, in which the stereotyped group's members feel more anxiety that they will prove the negative stereotype about their group (i.e., group-as-target stereotype threat; Aronson, Lustina, et al. 1999). Consistent with that conceptualization, participants are told that their performance on a particular task will be evaluated as a measure of their group's capabilities (Cohen and Garcia 2005; Steele et al. 2002; Schmader and Johns 2003; Marx, Stapel, and Muller 2005). Alternately, threat is framed in terms of how performance on a particular task might represent one's personal lack of abilities and the pressure of being judged in the case of performing poorly (i.e., self-as-target stereotype threat; Steele et al. 2002). Consistent with this explanation, participants are told that their performance in a particular task will be evaluated as a measure of their personal capabilities (Steele and Aronson 1995).

Shapiro et al. (2013) propose that Multi-Threat Framework helps to make predictions regarding the specific type of interventions that should be effective or ineffective in reducing the disruptive effect of group- or self-as-target stereotype threats. It has been theorized that self-as-target stereotype threats are rooted in concerns about one's personal abilities and capabilities, which raises a threat to a global self-integrity. Therefore, values affirmation is anticipated to diminish the self-evaluative implications of a poor performance by increasing the self-integrity and self-worth. However, values affirmation is not expected to be successful in the case of group-as-target stereotype threats because it has been argued that values

affirmation is a strategy to sustain one's self-integrity and self-worth and would be useless when one's concern centers on the reputation of one's group. Hence, values affirmation interventions have been thought not to yield a successful result in the case of group-as-target stereotype threats. In the research reported here, we suggest a new intervention strategy regarding the specific type of stereotype threats. Although previous studies demonstrate that values-affirmation intervention protected only against self-as-target stereotype threats (Shapiro et al. 2013), we propose that an affirmation intervention will also protect against group-as-target-stereotype threats and improve performance when it involves the affirmation of values important to the group rather than the self.

1.3 Group Values Affirmation

There may be some differences between the members of a particular social group, however, they may still share common social identification (Sherman, Kinias, Major, Kim, and Prenovast 2007). Individuals are more prone to protect and support their group when they developed identification with their group (Tajfel and Turner 1979). People act according to and support their groups because groups (which are important to individuals) are seen as a part of their self, as well (Tropp and Wright 2001; Sherman et al. 2007). In other words, people may define their selves based on their valued groups, which suggests that self and valued groups are highly aliasing constructs (Smith, Coats, and Walling 1999). Not only can being a member of a group lead to defensive and supportive acts on behalf of that group, but also one's group can serve as a psychological resource when one needs to confront the situations threatening their group identity (Sherman, et al. 2007). Thus, in the face of a group threat, values important to the group may similarly function as values important to the self (Sherman, et al. 2007). With this reasoning, using values affirmation as a framework (Sherman and Cohen 2006; Steele 1988), we proposed that a modified version of self-

affirmation which we called “*group-affirmation*” (affirming values central to the group) increases the task performance in the case of group-as-target stereotype threat.

Moreover, previous studies have demonstrated that strategies that are developed through the modification of values affirmation intervention may have beneficial results for members of certain groups (Stephens, Fryberg, Markus, Johnson, and Covarrubias 2012; Covarrubias et al. 2016). For example, research on cultural reframing showed that cultural pairs boost identity protection for students who endorse mismatching cultural models of education, and in turn increase their performance (Covarrubias et al. 2016; Stephens et al. 2012; Stephens, Townsend, Markus, and Phillips 2012). More specifically, culture-specific affirmations, also known as interdependent affirmations, enhanced the performance of students from interdependent backgrounds, which enhances connectedness with important others (e.g., family members, close friends; Markus and Kitayama 1991).

In the current research, we suggest that self-affirmation and group-affirmation should enhance the task performance of female college students following the stereotype threat. Specifically, group-affirmation is likely to decrease the compulsion of positively reflecting the group, we expected that group-affirmation intervention would decrease the potential negative effects of group-as-target stereotype threat. In contrast, self-affirmations are considered to protect against the evaluative implications of self-related threats (Shapiro et al. 2013), we expect that self-affirmation intervention would decrease self-as-target stereotype threat.

While all female students may recognize their membership in the social category as female students, there is presumably variation in the extent to which they appraise this category membership to be a central or important part of their social identity. *Social identity theory* suggests that group identity is one of the most crucial part of the self-concept. When group identities are threatened by unpleasant comparisons, individuals are more prone to

keep positive social identities (Tajfel 1981). Since negative stereotypes characterize particular groups as inferior to others in terms of specific dimensions, members who feel themselves to belong to these groups are presumably to experience a threat to their social identity. Under these circumstances, individuals who have high identification with their social groups are more inclined to strive psychological and behavioral methods to preserve and sustain their social identity than who have low identification with their social groups (Schmader 2002). In fact, research investigating stereotype threat in females (Brown and Pinel 2003; Eriksson and Lindholm 2007; Keller and Molix 2008; Schmader 2002) showed that more identified women are more sensitive and vulnerable to stereotype threat. Thus, making gender identity more salient may undermine female students' performance. For example, Danaher and Crandall (2008) found female students' performance on the test was lower when they were asked to state their gender at the beginning of the exam compared to female students who were asked to indicate their gender after completing exam. Thus, how female students define the characteristics of their gender group as identifying themselves is critical to understanding the consequences of group-affirmation in an educational context. In the present study, we anticipate that group identification with the gender group will moderate the effect of group-affirmation. Specifically, female students who have a high identification with their gender group are expected to perform better when they affirm values central to their group compared to female students who have low identification.

In the current experiments, we build and extend prior research on stereotype threat and values-affirmation intervention in three ways. First, some studies showed that modification (i.e., culture-matching, or cultural reframing) of interventions has beneficial results for certain groups. Through cultural reframing, cultural pairs boost identity protection for students who endorse incompatible cultural models of education, and in turn increase performance (Covarrubias et al. 2016; Stephens, Fryberg et al. 2012; Stephens, Townsend et

al. 2012;). For example, Covarrubias et al. (2016) found that Latino college students who completed an interdependent self-affirmation outperformed Latino students who completed an independent self-affirmation intervention, and outperformed European American students regardless of affirmation condition. Second, although the self-affirmation intervention has proven effective in increasing motivation and performance in the case of self-as-target stereotype threat, it has not previously been modified and implemented to boost motivation and performance in the case of group-as-target stereotype threat. Indeed, there is a reason to investigate the modified version of self-affirmation; namely, group-affirmation against the group-as-target stereotype threat. Third, values affirmation interventions that target the gender achievement gap regarding academic performance mostly have been designed and tested in Western cultures, especially in the United States. Despite their increasing popularity, we have limited knowledge about their effectiveness when transported to countries different from where they originated. Cultural norms and values related to gender practices are considered to affect acceptability, adaptability, and effectiveness of this brief evidence-based intervention. Therefore, testing the self-affirmation and group-affirmation interventions in a sample different than the Western samples will contribute to the generalizability of the findings to the other populations, as well.

1.4 The Present Study

The current paper tests whether self- and group-affirmations are differentially effective in increasing performance under specific forms of stereotype threat. We address three primary questions about these values affirmation interventions: (a) Can the *self-affirmation* intervention enhance female college students' performance when the stereotype threat targets their self? (b) Can the *group-affirmation* intervention enhance female college students' performance when the stereotype threat targets their gender group? and (c) Is the effect of the group-affirmation intervention moderated by identification with the gender group? We tested

our specific hypotheses across two experimental studies in which they explored female college students' performance on a challenging mental rotation task.

All procedures performed in the following two studies involving human participants have been thoroughly examined and approved by the Ethics Committee for Social Sciences of Koc University. Informed consent was obtained from all participants before inclusion in the study. Additionally, the authors declare that they have no conflict of interest.

2. Study 1

The first study investigated whether different forms of the values affirmation intervention (i.e., self-affirmation, group-affirmation) would impact female college students' task performance following relevant stereotype threats. Female students were first exposed to a self-as-target stereotype threat, group-as-target stereotype threat, or no threat condition and then to self-affirmation, group-affirmation, or control exercise. We predict that affirming values that are important to their gender group is likely to enhance female students' performance when their gender group is under threat (Sherman et al. 2007), while self-affirmation intervention will protect students against evaluative implications of threats to self-integrity (Sherman and Cohen 2006). Therefore, we hypothesize that students under the group-as-target stereotype threat condition will perform better in the mental rotation task when receiving the group-affirmation intervention, but not the self-affirmation intervention, as compared to the students in the control group. Similarly, we propose that students in the self-as-target stereotype threat condition will perform better in the mental rotation task when receiving the self-affirmation intervention, but not the group-affirmation intervention, as compared to the control condition. Additionally, since values affirmation intervention is designed to alleviate the perceived stereotype threat, we hypothesize that there will be no intervention effect under the no-stereotype threat condition.

2.1 Method

2.1.1 Participants and Design

Ninety undergraduate female students (M age = 21.88, SD = 1.34) from a small research university participated for extra course credit. Sample size was calculated using g-power software with .80 statistical power using large effect size that has been reported in the similar studies of value affirmation (Covarrubias et al. 2016; Miyake et al. 2010; Shapiro et al. 2013).

Students were first randomly assigned to one of the two types of the stereotype threat or no-stereotype threat conditions, and then to one of the three intervention conditions. Thus, the experiment was a 3 (stereotype threat: self-as-target, group-as-target, no-threat) X 3 (intervention: self-affirmation, group-affirmation, control) between-subjects design with a total of 9 conditions.

2.1.2 Materials and Procedure

Students were recruited into a computer lab and received an overview of the study, which actually induced the stereotype threat manipulation before receiving the intervention. The stereotype threat manipulation was adapted from Shapiro et al. (2013). The group-as-target stereotype threat framed the mental performance test to be taken as a measure of women's abilities, whereas the self-as-target stereotype threat framed the same test as a measure of the test taker's personal abilities. Students assigned to a group-as-target stereotype threat condition read the following instructions:

In today's session, we would like to get a measure of intellectual ability for male and female students by having you take an intellectual ability test ... Your performance on this test will be used to help us establish intellectual performance norms for female and male students. After the test, we will provide you with feedback about females' performance relative to males' performance and ask you some questions about test taking.

Students assigned to a self-as-target stereotype threat condition read the following instructions:

In today's session, we would like to get a measure of your intellectual ability by having you take an intellectual ability test ... Your performance on this test will be used to help us establish your personal intellectual ability. After the test, we will provide you with feedback about your performance relative to other students and ask you some questions about test taking.

Students were informed that they would work on two ostensibly unrelated tasks. The first task was the values affirmation intervention. Students were given the same list of values (e.g., athletic ability, being good at art, creativity, living at the moment, membership in a club, music, politics, relationships with family and friends, religious values, sense of humor) used in the previous values affirmation studies (Cohen et al. 2006; Cohen et al. 2009; Covarrubias et al. 2016). Students were then asked to choose one value that was “most important to you” (self-affirmation), “most important to your gender group” (group-affirmation), or that was “least important to you” (control condition). Students in the self-affirmation and group-affirmation conditions were also asked to give a written explanation of why this value was important to them or to their gender group by providing real life examples. Students in the control condition were asked to write about why the value they have chosen might be important to someone else.

Students then completed the mental performance task. Performance was measured using the Vandenberg and Kuse's (1978) Mental Rotation Test, updated under the guidance of M. Peters (Peters, Laeng, Latham, Jackson, Zaiyouna, and Richardson 1995). The task consists of 24 items. Each item had a target image and four comparing images. Within four comparing images, two of them were always the rotated versions of the target image, and the remained two were always distinct than the target image (Martens et al. 2006). Students were

given an instruction to rotate the images in their mind to tick the two comparison images that they believe match the target image. Additionally, students were informed that both correct comparison images needed to be marked in order to answer the question correctly. All students were guided through a practice page before the actual testing phase. Students had 12 minutes to work on the test and try to be accurate at the same time as quickly as possible (Martens et al. 2006).

Students were then asked demographic questions (e.g., age, gender, major, seniority, parents' education). After the completion of all tasks, students were fully debriefed and given course credits. Participation in the study took approximately 45 minutes.

2.2 Results

A 3 (stereotype threat: self-as-target, group-as-target, no-threat) X 3 (intervention: self-affirmation, group values-affirmation, control) between-subjects analysis of variance (ANOVA) was conducted, with students' score on the mental rotation task (number correct) serving as the dependent variable. Results showed a main effect of stereotype threat, $F(2, 81) = 6.43, p = .003, \eta^2 = .16$, and a main effect of intervention $F(2, 81) = 5.03, p = .009, \eta^2 = .12$. However, this was not qualified by a significant interaction between stereotype threat and intervention condition, $F(4, 81) = 0.40, p = .80, \eta^2 = .02$.

The mean mental rotation task score for the entire group was 12.81 ($SD = 5.09, N = 90$), with scores ranging 3 to 22. As anticipated, a main effect was observed for the stereotype threat. Independent from intervention conditions, the number of questions answered correctly by the students in the no-threat condition ($M = 14.93, SD = 4.05, N = 30$) was significantly higher than the students in self-as-target stereotype threat ($M = 10.60, SD = 4.76, N = 30$), $p = .001, (d = .97)$. The number of questions answered by the students in the self-as-target stereotype threat was marginally higher than the students in the group-as-target stereotype threat ($M = 12.90, SD = 5.56, N = 30$), $p = .069, (d = .44)$. A significant main effect was

observed for the intervention condition as well. Independent from stereotype threat condition, students in the self-affirmation condition ($M = 14.70$, $SD = 4.74$, $N = 30$) answered significantly larger number of questions correctly than the students in the control condition ($M = 10.86$, $SD = 5.33$, $N = 30$), $p = .002$, ($d = .76$). Students in the self-affirmation condition answered more questions correctly than the students in the group- affirmation condition ($M = 12.86$, $SD = 4.60$, $N = 30$), but this difference was not statistically significant, $p = .151$, ($d = .44$).

Fig. 1

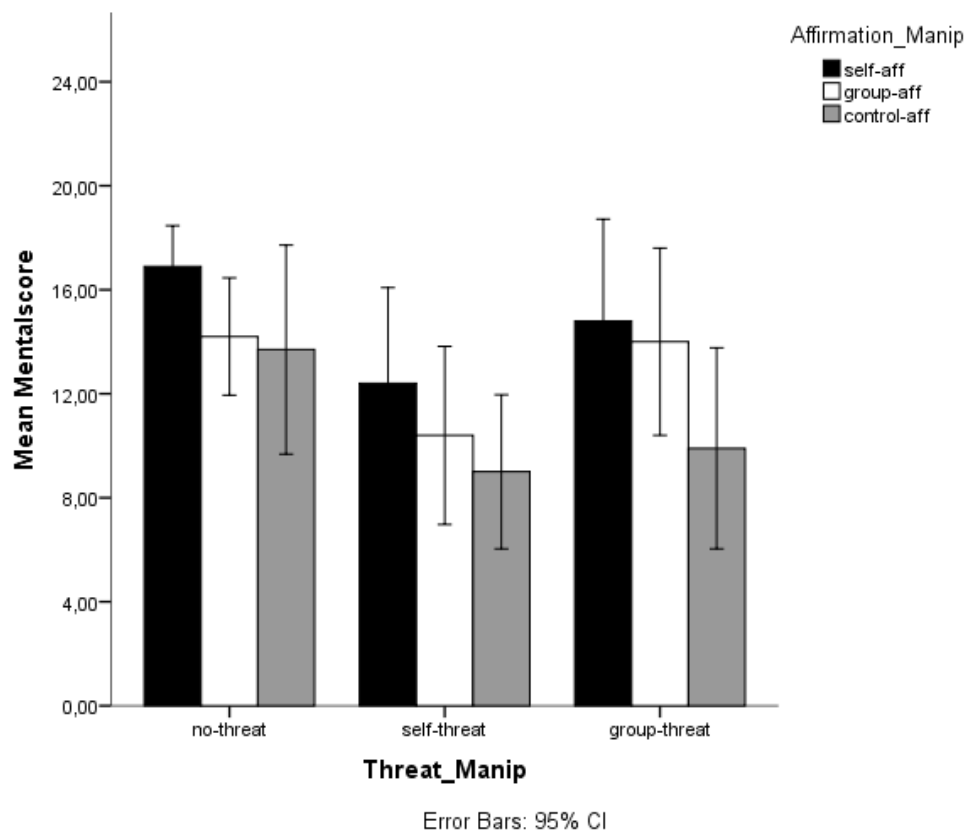


Figure 1. Female students' performance on a mental rotation task as a function of the type of the stereotype threat and the type of intervention.

As shown in **Fig. 1**, the results for the simple effect of the type of intervention within the level of stereotype threat type showed that under the no-threat condition, students in the self-affirmation condition had higher scores than students in the control condition, $p = .130$,

whereas students in the group-affirmation had similar scores relative to those in the control group, $p = .812$. Within the self-as-target stereotype threat condition, students in the self-affirmation condition ($M = 12.40$, $SD = 5.14$, $N = 10$) had higher scores on the mental rotation task compared to students in the control condition ($M = 9.00$, $SD = 4.13$, $N = 10$), but this difference was not statistically significant, $p = .108$. The difference in mean scores was smaller but non-significant between students in the group-affirmation ($M = 10.40$, $SD = 4.78$, $N = 10$) and control conditions, $p = .506$. Under the group-as-target stereotype threat, students both in the self-affirmation ($M = 14.80$, $SD = 5.47$, $N = 10$) and group-affirmation ($M = 14.00$, $SD = 5.03$, $N = 10$) conditions had higher scores compared to students in the control condition ($M = 9.90$, $SD = 5.40$, $N = 10$), $p = .022$, ($d = .98$) and $p = .054$, ($d = .78$) respectively).

2.3 Discussion

Inconsistent with the previous research (Shapiro et al. 2013; Martens et al. 2006), exposure to a self-affirmation intervention did not buffer against the negative effects of (self-as-target) stereotype threat. However, when students were exposed to group-as-target stereotype threat, we found increased performances of the students in both the self-affirmation and group-affirmation compared to the control condition. That is, both self-affirmation and group-affirmation buffered against the negative effects of group-as-target stereotype threat and led to increased performance on the mental rotation task. Study 1 further revealed that the self-affirmation intervention was also effective when participants were not exposed to stereotype threat. The reason that we observe an intervention effect under the no stereotype threat condition may be that the female students may still be experiencing stereotype threat, even though we did not tell them that their performance would be evaluated, by just being engaged in a performance task (Steele and Aronson 1995; Brown and Pinel 2003).

3. Study 2

Study 1 provided initial evidence that the group-affirmation intervention was marginally effective under the group-as-target stereotype threat, yet, contrary to our expectation the effect size of the group-affirmation was smaller than the self-affirmation intervention. We argue that this may occur because of the moderation effect of the identification with the gender group. That is, group affirmation may be effective especially for female students who are identified with their gender group. Hence, study 2 examined the moderating role of gender identification. Female students were randomly assigned to a gender identification manipulation (i.e., low, and high gender identification) and then were randomly assigned to one of the three intervention conditions (i.e., self-affirmation, group-affirmation, control). We anticipated that group-affirmation intervention would lead to better performance on the mental rotation task for female students who were manipulated to have higher identification with their gender group as compared to students who were manipulated to have lower identification with their gender group. We hypothesize that students in the high group identification condition would perform better on the mental rotation task under the group-affirmation intervention as compared to the self-affirmation intervention or control conditions, and students in the low group identification condition will perform better on the mental rotation task under the self-affirmation intervention as compared to the group-affirmation intervention or control conditions.

3.1 Method

3.1.1 Participants and Design

Sixty-six undergraduate female students (M age = 21.56, SD = 1.98) participated for extra course credit. Sample size was calculated using g-power software with .80 statistical power in terms of large effect size that has been reported in the similar studies (Shapiro et al. 2013).

Students first were randomly assigned to one of the two gender identification conditions and then to one of the three intervention conditions. Thus, the experiment was a 2

(gender identification: low-identification, high identification) X 3 (intervention: self-affirmation, group-affirmation, control) between-subjects design.

3.1.2 Materials and Procedure

Students were recruited into a computer lab and received gender identification manipulation before receiving the intervention. The identification manipulations used in the current study adapted from existing research (Miron, Branscombe and Biernat 2010). Students read the following instruction for the high identification condition.

Please describe to what extent you feel similar to female students in your college by providing an example. Please describe if there are any other similarities that you share with female college students.

For the low identification condition students read the following instruction.

Please describe to what extent you feel dissimilar to female students in your college with providing an example. Also, please describe if there are any other differences that you share with female college students.

After the gender identification manipulation, Study 2 utilized the same procedure as in Study 1. Students were assigned to one of the three conditions of the values affirmation (i.e., self-affirmation, group-affirmation, control condition) and then completed the same mental performance task as in Study 1 and the demographics questionnaire.

3.2 Results

A 2 (gender identification: low, high) X 3 (intervention: self-affirmation, group values-affirmation, control) analysis of variance (ANOVA) was conducted, with students' scores on the mental rotation task (number correct) serving as the dependent variable. There was no main effect of gender identification, $F(1, 60) = 1.14, p = .29, \eta^2 = .02$ (low gender identification condition $M = 13.66, SD = 4.80, N = 33$ and high gender identification condition $M = 12.39, SD = 5.70, N = 33$), and no main effect of intervention condition, $F(2,$

60) = 2.37, $p = .10$, $\eta^2 = .08$ (group-affirmation $M = 14.86$, $SD = 5.69$, $N = 22$; self-affirmation $M = 12.00$, $SD = 5.18$, $N = 22$; control condition $M = 12.22$, $SD = 4.61$, $N = 22$).

Fig. 2

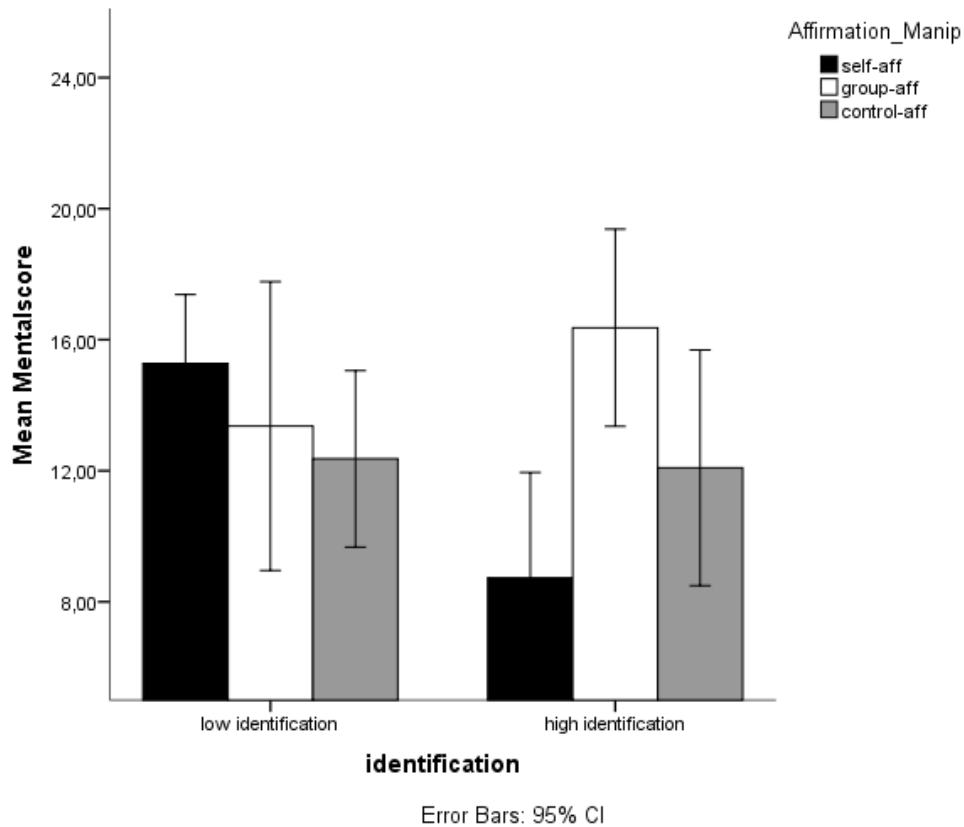


Figure 2. Female students' performance on a mental rotation task as a function of identification with the gender group and the type of intervention.

These main effects were qualified by the anticipated interaction between gender identification and intervention condition though, $F(2, 60) = 5.51$, $p = .006$, $\eta^2 = .18$. As shown in **Fig. 2**, under the high identification condition, students in the group-affirmation intervention condition ($M = 16.36$, $SD = 4.47$, $N = 11$) performed significantly better than students in the self-affirmation ($M = 8.72$, $SD = 4.79$, $N = 11$), $p = .000$, ($d = 1.64$) and control conditions ($M = 12.09$, $SD = 5.35$, $N = 11$), $p = .043$, ($d = .86$). Students in the control condition performed better than students in the self-affirmation condition, but this difference was not statistically significant, $p = .109$. Under the low identification condition, the

difference in mean scores was smaller but non-significant between students in the self-affirmation intervention condition ($M = 15.27$, $SD = 3.13$, $N = 11$) and group-affirmation ($M = 13.36$, $SD = 6.5$, $N = 11$), $p = .359$ ($d = .37$) and control condition ($M = 12.36$, $SD = 4.00$, $N = 11$), $p = .164$ ($d = .81$). Also, under the low identification condition, students in the group-affirmation had similar scores relative to those in the control group, $p = .630$ ($d = .18$).

3.3 Discussion

Experiment 2 provided evidence that the group-affirmation intervention increased the scores of the female students who were highly identified with their gender group. This suggests that a group-affirmation does not simply improve the scores of female students, but that the effect of this type of affirmation may be more specific for students who are highly identified with their gender group than for students who are less identified with their gender group.

Furthermore, the results indicate that for female students who are highly identified with their gender group, the self-affirmation intervention may even be risky and produce an adverse effect. These results are critical in terms of designing interventions to improve the performance of specific groups (Cohen and Garcia 2014).

4. General Discussion

The purpose of the present research was to test the performance of a modified version of a values affirmation intervention; namely, a group-affirmation intervention in the case of group-as-target stereotype threat. Study 1 revealed that group-affirmation protected female college students against group-as-target stereotype threat. Self-affirmation interventions, which are believed to effectively reduce stereotype threat, has been proposed to work only in the context of self-as-target stereotype threat. However, in the current study, we demonstrated that a modified version of values affirmation (i.e., group-affirmation) protected against group-as-target stereotype threat, as well.

Although we did not anticipate it, in Study 1 we observed that self-affirmation also protected female students against group-as-target stereotype threat, inconsistent with previous studies (Shapiro et al. 2013). Although self-affirmation and group-affirmation interventions were similarly effective against group-as-target stereotype threat, the processes underlying self-as-target or group-as-target stereotype threats may not be the same and therefore these interventions targeting those threats are not interchangeable. We argue that these results can be explained best in terms of a connectionist model of self-ingroup overlap in which people may define their self in terms of their valued groups (Tropp and Wright 2001). For instance, Aron, Aron, Tudor and Nelson (1991) found that participants were faster on self-descriptive judgments for traits on which participants match with their ingroups, rather than mismatched. This basic pattern of reaction time facilitation was also replicated for other types of groups, such as university affiliation (Smith, Coats, and Wallings 1997). These findings suggest that ingroups become a part of the self in which group features affect self-reports. Self can also become part of a mental representation of the ingroup (Smith, Coats, and Wallings 1999). More specifically, self-characteristics may influence people's judgments about their ingroup. Studies that have tested the model of self-ingroup overlap argue that the view of self and group representations is linked. Individuals sometimes see or describe themselves in terms of varied personal identities, and other times as group members that are essentially interchangeable (Smith et al. 1999). The connectionist model of representation offers convincing explanations of context sensitivity (Smith 1998). In one situation, for example, individuating characteristics may be most salient; however, in another situation, group characteristics may be most salient. In terms of the fundamental idea that group membership includes some sort of self and vice versa, it is very possible that in our results, self can become a part of one's ingroup. Although self-affirmation was tested as an intervention against group-as-target stereotype threat, group characteristics may implicitly get accessed

and self-affirmation may increase participants' performance in the case of group-as-target stereotype threat, as well.

In addition, in Study 1, which included no-stereotype threat-intervention condition, we offered a more detailed model of stereotype threat and specific intervention strategies targeted to those threats and found that there was no intervention effect when participants were not exposed to any kind of threat. This finding is important for the implications of stereotype threat research. Namely, in stereotype threat research, it has been widely shown that salience of negative stereotype threat about one's identity or identity group in a given context systematically reduces one's performance (Schmader et al. 2008; Spencer et al. 1999; Good et al. 2008; Dahaner and Crandall 2008; Beilock et al. 2007; Schmader and Johns 2003). Previous research has also revealed that self-affirmation intervention is effective at eliminating negative effects of stereotype threat and preserving performance without the availability of a stereotype threat induction (Cohen et al. 2006; Cohen et al. 2009; Miyake et al. 2010). These studies tested the intervention effect in terms of the assumption that negatively stereotyped groups' members are likely to worry about confirming the negative stereotypes about their ingroups. However, our results suggest that group-affirmation interventions were only effective when the specific threat was salient for the specific stereotyped groups. It seems that individuals who are members of a negatively stereotyped group were unaffected by the negative stereotypes about their ingroups until these negative stereotypes became salient.

In the second study, we tested the moderation effect of gender identification. We demonstrated that group-affirmation increased the performance of the female college students when they were highly identified with their gender group. This finding highlights that the targets of the adapted version of the self-affirmation intervention matter; namely, in this case, the group-affirmation worked best. The practical implication in here is clear: A failure to

consider whom an intervention is designed for can lead to ineffective intervention for certain groups. We also found that under the high identification condition, students in the self-affirmation condition performed worse than the students in the control condition. This result is particularly important because it shows that self-affirmation intervention even may have a detrimental effect on students' performances who were highly identified with their gender group. As ingroup identification may be higher in collectivistic countries (Triandis 1990), this finding further emphasizes the need for culture-specific adaptations for the value-affirmation intervention.

The present set of studies advances the stereotype threat and values-affirmation intervention literature in a number of ways. First, previous research has continued to overlook the distinction between self and group as the potential target of stereotype threat. Present research provides more support for the experimental evidence of the Multi-Threat Framework (Shapiro and Neuberg 2007; Shapiro et al. 2013), showing multiple stereotype threats rather than one single threat, in which individuals can be targeted in terms of different abilities, such as group abilities (i.e., group-as-target stereotype threat) or personal abilities (i.e., self-as-target stereotype threat). Second, the present research provides evidence that group-as-target stereotype threat can be reduced using values affirmation techniques. Prior studies demonstrated that self-affirmation works only in the context of self-as-target stereotype threat. We provide evidence that modified version self-affirmation (i.e., group-affirmation) works in the context of group-as-target stereotype threat. Specifically, participants in the group-affirmation condition were instructed to reflect on why a value may be important to their gender group instead of themselves. Although participants were given the same list of values, when the instruction refers to "their gender group," values affirmation technique also reduced the negative effects of group-as-target stereotype threat. Third, although these studies are the first to test group-affirmation for female college students, they also provide evidence

about for whom the group-affirmation would work best. Namely, Study 2 revealed that a group-affirmation increased the performance of female college students when they were highly identified with their gender group.

4.1 Limitations and Future Directions

The current research reinforces the importance of considering “context-specific purposes” for affirming female college students’ sense of self or group and, subsequently, for enhancing their performance. Yet, there are limitations to the current studies. First, our main concern was to reduce the gender achievement gap, so we tested the effectiveness of group-affirmation in female college students. Future research should test whether group-affirmation would work to reduce other achievement gaps (e.g., ethnicity, socioeconomic status). Prior studies demonstrated that culture-specific affirmations (e.g., interdependent self-affirmation) those that highlights one’s family increased performance of students from interdependent cultural background compared to a self-affirmation (i.e., Latino students; Covarrubias et al., 2016). Thus, group-affirmation may increase students’ performance from specific ethnicities among highly identified group members (e.g., Latino or Black students). Second, we used a mental rotation task in order to measure students’ immediate performance. Previous studies found long-term positive effects of self-affirmation (Cohen et al. 2006; Cohen et al. 2009). Future research is needed to investigate whether group-affirmation also yield positive long-term effects for female college students. Thus, it would be important to determine the effect of this affirmation on students’ grades or other measures of performance for female college students.

One critical issue not examined in the current research is that although the present studies provided some insight into why self-affirmation and group-affirmation interventions reduced the detrimental effect of stereotype threats, we did not test the mechanism explicitly. However, for the current research, we assumed that group-affirmation would be more

effective when the participants' concern centers on their performance would represent their group abilities (i.e., group-as-target stereotype threat), and self-affirmation would be more effective when the participants' concern centers on their performance would represent their personal stereotypic abilities (i.e., self-as-target stereotype threat; Shapiro et al. 2013). Thus, to what extent an intervention is effective in a particular situation can give clues for the processes underlying each of these interventions. However, future research should examine a more direct test of these processes, considering the connectionist model of self-group overlap.

4.2 Conclusion

In the present research, we assessed the efficacy of two stereotype threat interventions (i.e., self-affirmation and group-affirmation) based on Multi-Threat Framework (Shapiro et al. 2013). With this research, we hoped to facilitate a complete understanding of stereotype threats and to develop more effective interventions to mitigate the detrimental effect of stereotype threat for stigmatized groups. Furthermore, through the modification of the interventions, we hope to contribute the transportability and the adaptability of the original interventions to different groups and cultures. Thus, the current research suggests taking caution using a uniform approach to the application of psychological interventions and instead encourages researchers to consider different understandings of self while instituting common stereotype threat interventions. Taking into account students' different cultural and background contexts and modifying interventions to reflect these differences would ultimately be more beneficial, enabling researchers to develop the most effective interventions, thereby reducing the pernicious effect of stereotype threat and closing achievement gaps.

CHAPTER 4

**A CUSTOMIZED SOCIAL BELONGING INTERVENTION TO IMPROVE
ATTITUDINAL OUTCOMES OF SYRIAN REFUGEE MIDDLE SCHOOL
STUDENTS**

Abstract

The number of refugee children increase in schools. Syrian refugee students in Turkish society are in primary need of attention due to the integration process to a new education system that potentially threatens their optimal development and educational achievement. Studies have only identified the challenges experienced by those students, however, the targeted interventions to mitigate the psychological impact of integration stressors on refugee children's academic achievement is scarce. This study aims to investigate the transportability and adaptability of social belonging intervention to minimize the psychological impact of integration stressors experienced by refugee students living in Turkey. In the current research the sample consisted of 531 middle school students (Study 1; 131 Syrian and 137 Turkish and Study 2; 134 Syrian and 129 Turkish). This is an experimental study which investigates the effect of customized social belonging intervention targeted refugee students' current challenges and to increase their attitudinal outcomes toward school. Customized social belonging intervention enhanced refugee students' potential to succeed in school, performance state self-esteem and identification with school (in the first study) and social belonging in school and school trust (in the second study). Refugee students' adaptation to a new education system widely effected by psychological factors. The findings of the current studies pave the way for further studies to address the experiences and challenges of Syrian refugee students to improve their academic outcomes.

Introduction

Refugee children have an increasing presence in school communities. Only in the case of the Syrian refugee crisis and Turkey as a host country, the number of school-age Syrian refugee children has reached over 1 million. These students constitute a high-risk group for educational achievement due to various structural and psychological factors. Psychologically, even though many children experience drawbacks with ‘fitting in’ at school (Roeser, Midgley, & Urdan, 1996; Goodenow, 1993) refugee kids suffer from ‘*belonging uncertainty*’ – where negatively stereotyped groups’ members are not confident about their social connection in their both academic or professional life – more than others and face more specific challenges as threatened by factors such as being exposed to a new language or even a new alphabet, which result in the lack of sense of social and school belonging, vulnerability to stereotype threat, isolation, and even discrimination (Coll & Magnuson, 1997; Seker & Sirkeci, 2015; Sahin & Sumer, 2018). Thus, once the displacement is completed, the school-age children’s education becomes to the primary concern. Since these children have a great potential to lose their initial motivation and enthusiasm toward the school climate and academic achievement (Suarez-Orozco, 2000; Orozco & Orozco, 2001). Yet, the literature on targeted interventions to mitigate the psychological impact of integration stressors on refugee children’s academic achievement is scarce.

This study focuses on the transportability and adaptability of a social belonging intervention that has been shown to increase the sense of belonging of disadvantaged students and, in turn, increase their academic achievement, to the refugee context for the first time (Walton et al., 2015; Yeager et al., 2016; Goyer et al., 2019). The initial social-belonging intervention, delivered to students during the challenging transitions, was intended to promote nonthreatening interpretations of adversities through normalizing the feelings towards the adversities that they may encounter (Walton & Cohen, 2007). However, despite

the burgeoning interest in school-based refugee services (Rousseau & Guzder, 2008) that suggest that refugee students' relatively greater uncertainty on their sense of belonging toward school environment and its impact on their future academic achievement and overall well-being is a critical area of study, there has been no study investigating whether the social belonging intervention, as a low-cost and scalable strategy, would work in the refugee context. The aim of the current study is, by conducting two randomized trials with middle-school refugee students, to test the effectiveness of (1) the original social belonging intervention and (2) its customized version adapted to the specific challenges refugee students face, in increasing their immediate attitudinal outcomes.

The Social-Belonging Intervention

The social-belonging intervention, which is also known as a 'light-touch' (social psychological) or 'wise' intervention, in a sense, does not try to change the actual challenges that the disadvantaged students face. Instead, it intends to prevent students to attribute those challenges to their sense of social and school belonging and provide confidence to confront the daily adversities they encounter (Walton, Logel, Peach, Spencer, & Zanna, 2015; Walton & Cohen, 2007, 2011). The intervention delivered to students during potentially difficult transitions is designed to encourage non-threatening interpretations of drawbacks through normalizing the feelings towards the difficulties that they may face (Walton & Cohen, 2007). For instance, in a new academic setting, students may worry about whether others at school (e.g., peers, teachers, professors) will accept them, especially when they belong to a socially stigmatized group prone to be exposed to *stereotype threat* and *discrimination* which may harm their *sense of belonging* – feeling socially connected to others (Mendoza-Denton, 2002; Yeager et al., 2016; Walton & Cohen, 2007). The suggested theoretical model including the recursive process of lay theories (i.e., belief → psychological interpretation → behavioural response → academic outcome) argues that reconceptualizing these experiences as not

unique to them and common to all students (i.e., psychological interpretation) can lessen worries about belonging and, in turn, enable them to have sustained engagement with their academic environment (i.e., behavioural response) and boost their academic performance. (Yeager, Walton, Brady et al., 2016).

Randomized controlled studies have found that social-belonging interventions improve students' sense of belonging and, in turn, increase their academic achievement especially for students who are socially stigmatized and underrepresented in a school setting. The first successful results for the effectiveness of a social-belonging intervention on students' academic outcomes came from a sample of African American college students (Walton & Cohen, 2007, 2011). The social-belonging intervention and control materials were delivered to Black and White students in an hour-long one-to-one session in a university where the European American students were the majority. While White students' grades were unaffected by the intervention, Black students' grades were increased over three years and the racial achievement gap between those students was reduced by half. In another study, the belonging intervention was adapted for female students in the STEM fields (Walton et al., 2015). Female students in the first semester of STEM majors (e.g., computer, electrical, mechanical engineering) participated to the study, and social-belonging intervention raised those students' grades over the first academic year compared to control condition, eliminating a large gender achievement gap (Walton et al., 2015). Other studies aimed to examine the effectiveness of belonging intervention in larger populations (Yeager et al., 2016; Broda et al., 2018; Murphy et al., 2019). For example, Yeager and colleagues tested the social-belonging intervention among urban charter graduates including mostly Black and first-generation students who entered college. The intervention improved the full-time college enrolment of those disadvantaged students from 32% to 43% over the next year (Yeager et al., 2016 Experiment 1).

Research that has been conducted with college students examining the belonging effect may not be directly applicable to middle school students' experiences, therefore, other studies extended their approaches to test the belonging intervention for students who are transitioning to middle school. One research examined the impact of the social belonging intervention on behavioural measures with the aim of reducing African American students' discipline citations during their transition to middle school (Goyer et al., 2019 Experiment 2). Both Black and White sixth-grade students were delivered belonging and control materials as an in-class exercise in 25-minute sessions. The social-belonging intervention decreased Black boys' disciplinary citations by 65% and enhanced their belonging levels while reducing belonging uncertainty and stereotype threat levels. Borman and colleagues (2019) similarly administered belonging intervention among sixth-grade middle school students in 11 public schools. Students in the intervention group had higher GPAs, fewer Ds and Fs as a letter grade and fewer absences. Additionally, those students also reported positive attitudinal change including higher levels of social belonging, school trust, identification with school, and lower levels of evaluation anxiety at the end of the school year.

Furthermore, the social-belonging intervention was shown to provide a basis for long-lasting perceptual shift in terms of appraising of social experiences and its impacts continue in the long run (Walton & Cohen, 2007; 2011; Walton et al., 2015; Yeager et al., 2016; Goyer et al., 2019; Brady, Cohen, Jarvis & Walton, 2019; Walton & Crum, in press). For example, a week after the belonging intervention, higher potential to succeed was reported in terms of academic fit by students in the belonging intervention condition compared to control condition (Walton & Cohen, 2007). Walton and Cohen (2011) also found that students demonstrated an ongoing improvement both in their academic records (e.g., GPA) and well-being 3 years post intervention. In a follow-up study which assessed the long-term adult outcomes of the same participants in Walton & Cohen (2011) indicated the lasting benefits,

in which African American adults who had received the social belonging (versus control) materials in the first year of college (7 to 11 years ago) reported greater career satisfaction and well-being (Brady et al., 2019).

A conflicting evidence from the replication study showed that a brief social psychological intervention (BSPI) (namely values affirmation) had no effect on the performance of middle school minority students and even had an adverse effect on the performance of middle school female students (Dee, 2015). These inconsistent findings regarding the effectiveness of BSPIs suggest the customization of the interventions that are particularly prominent and effective for different social groups.

Customization of The Social Belonging Intervention

The effectiveness of any social psychological intervention may depend on how well it is modified to suit the demands of the targeted group and context (Yeager & Walton, 2011). To gain the maximum impact, the social-belonging intervention must (a) respond to the students' current concerns and experiences in a given school context and (b) form practical approaches to belonging in that context (Walton et al., 2017). In many school settings, students experience more or less the same adversities and challenges related to the sense of belonging. For example, during the transition to middle school, young students may find it hard to get used to a new academic environment, struggle academically, feel lonely, and overwhelmed by their teachers. Although the standard belonging materials may seem to match the existing students and school context, its effectiveness still has to be proven in a range of contexts (e.g., refugee students). The social-belonging intervention is not content- and context-free, thus it is important to make sure that the intervention content connects to the students' current challenges and addresses their experiences (Walton et al., 2017). Thus, social-belonging intervention as an evidence-based tool to minimize the detrimental effect of *belonging uncertainty* on disadvantaged students' educational outcomes likely needs to be

calibrated to mention the educational drawbacks encountered by particular groups of students (e.g., refugee students). Therefore, testing the social-belonging intervention for Syrian refugee students who have specific challenges raises the need for customization.

The customization process includes understanding the challenges that threaten the sense of belonging in a specific school setting and defining applicable and practical approaches that students can have a space to participate and present their reaction to those challenges (Walton & Crum, in press). Previous studies testing the social-belonging intervention mostly had adapted the standard belonging materials to a new context by customizing its content, under the assumption that particular contexts generate specific challenges and experiences that threaten the sense of belonging (Walton et al., 2015; Yeager et al., 2016; Goyer et al., 2019). For example, when women's sense of belonging was undermined by being in male-dominated majors (e.g., engineering), customized social-belonging intervention resulted in the inclusion of new stories reflecting sense of alienation or not being taken seriously by their male counterparts (Walton et al., 2015). In another study, stories had been centered on building relationships with peers, faculty and staff in college (Yeager et al., 2016). Customization also allowed stories to mention different worries and themes that can resonate well for middle school students, including but not limited to experiencing trouble finding their classes in a big school, avoiding communication with their teachers, and forgetting their locker combination (Goyer et al., 2019).

The Present Research

The aim of the present research is, by conducting two experiments with Syrian refugee students, to develop and test the original and customized versions of the social-belonging intervention in the refugee context. Our specific research questions are: (1) Does the standard social-belonging intervention, as a low-cost and scalable strategy, work for refugee middle school students? (2) Can we increase the effectiveness of the social belonging

intervention by adapting it to specific challenges encountered in middle school refugee context? Thus, to test and explore these questions we conducted randomized controlled studies in which we investigated the effectiveness of social belonging (Study 1) and language-specific belonging interventions (Study 2) for Syrian refugee middle school students. Previous studies mostly assessed the effect of belonging intervention on academic outcomes (e.g., GPA, course grade) (Walton & Cohen, 2007; 2011) however in this study, following the theory of change (Borman et al., 2019, see figure 1), we aimed to observe the immediate positive impact of belonging interventions on attitudinal change (e.g., identification with school, school trust) treated as intermediate outcomes in a refugee context.

The social-belonging intervention targeted critical transition periods to foster a non-threatening interpretation of adversities. It has been assumed that all students (either advantaged or disadvantaged) may experience frequent social drawbacks, feeling of not belonging or isolation to some extent (Walton & Cohen, 2011; Walton et al., 2017). However, because stigmatization accelerates belonging uncertainty, and refugee students (as a stigmatized group) experience relatively greater belonging-uncertainty about their belonging during critical (e.g., integration) processes, specifically we expect that Syrian students will benefit significantly from the intervention compared to Turkish students.

Study I

Refugee students face more than one social setback in the school environment. Thus, it was important to observe the effectiveness of an original version of the belonging intervention adapted to a refugee context. Therefore, the first study investigated whether an adapted version of social-belonging intervention would impact Syrian refugee middle school students' attitudes toward school. Syrian refugee students (and Turkish students) were either exposed to the social-belonging intervention condition or a control exercise (adapted Walton & Cohen, 2007; 2011). We expected that Syrian refugee students who were exposed to the

social-belonging intervention had better scores on the targeted intermediate outcomes than Syrian refugee students in the control condition.

Methods

Participants and Design. Participants consisted of 268 sixth, seventh and eighth-grade middle school students (72 Syrian female, 59 Syrian male, 69 Turkish female, 68 Turkish male) from south-eastern Turkey. The specific criteria for eligibility included (1) students who were born in Syria, (2) students who have been living in Turkey for at least 1 year, and (3) students who are registered into the national Turkish education system. Before the intervention, all students were handed out a parental permission slip in which parents either could accept or refuse the participation of their child to the research. Only students who returned the parent consent form participated in the research.

Sample size was calculated using g-power software with .80 statistical power using medium effect size that has been reported in similar studies of belonging intervention (Walton & Cohen, 2011). Students were randomly assigned to belonging intervention and the control condition.

Procedures. Classrooms compared to laboratory settings can be potentially chaotic to implement the intervention (Sherman et al., 2013). To monitor this setting similar to carefully designed laboratory studies, a great deal of preparation about the methodological details was accomplished. First, the implementation of the belonging intervention and control exercises were firmly scripted (script in Walton & Cohen, 2007; 2011 were used). Because the belonging intervention and control packages were implemented by either a Syrian male teacher (for Syrian students) or a Turkish male teacher (for Turkish students), meeting with those teachers before the administration of the manipulations was quite essential. Each teacher was met individually, trained and allowed to read the script very carefully. All questions raised in those meetings related to the script were answered and clarified.

Students were randomly assigned to the belonging intervention or the control condition and then all students read a hypothetical report based on the results of a survey conducted with more senior Syrian and Turkish students who continued his/her education in Turkey (adapted from the original script of the intervention, Walton & Cohen, 2007; 2011). In the belonging condition, the report basically included excerpts focused on how students' concerns center on their sense of belonging to the school environment during their first year but grew confident in their belonging over time. Belonging related concerns were reflected as commonly experienced by many students initially, however those concerns were also shown as temporary which dissipated with time (See Appendix A for all excerpts). We benefited from the *saying-is-believing effect* – the disposition to confirm messages that one has intentionally supported in their own words – to promote students to internalize the message (Aronson et al., 2002; Walton & Cohen, 2011). After the belonging intervention, students were asked to write an essay with a length of their choice in 15 minutes describing their own experiences at school during the integration process. Students were also informed that their essays will be shown to upcoming students to ease their integration process to a new school environment. In the control condition, the procedure was exactly the same as the belonging condition, but the survey addressed topics unrelated to the sense of belonging and were instead related to the physical environment (e.g., school environment, city and weather). After completion of the manipulation part, all students were asked to complete the outcome measures (each of these measures is described in the detail in the next section) and demographic questions (e.g., gender, age, grade, years living in Turkey). The experiment lasted approximately one hour.

Measures. Students completed 5 different measures drawn from the previous research in five-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Cronbach's alpha value for each measure for the first study were provided in the Table 1.

Table 1

Reliability of Outcome Measures

Measures	Number of items	Cronbach's alpha values	
		Study I	Study II
Potential to Succeed in School	3	0.68	.60
Social Belonging in School	5	0.60	.60
Performance State Self-Esteem	7	0.65	.62
School Trust	3	0.71	.51
Identification with School	2	0.69	.64

Note. Table 1 depicts coefficient alpha values for each scale for Study 1 & 2.

Potential to Succeed in School. A 3-item (subscale of academic belonging) measure assessed the degree to which students have the potential to succeed in school (e.g., “I know what I need to do to succeed at school”; “I am the kind of person that does well in my school”, see Appendix B for full scale, Cook et al., 2012).

Social Belonging in School. A 5-item (subscale of academic belonging) measure assessed the degree to which other people in school accept them (e.g., “People in my school accept me”; “I feel like I belong in my school”, see Appendix B for full scale, Cook et al., 2012).

Performance State Self-Esteem. Seven items (Heatherton & Polivy, 1991) were used to assess short-lived changes the degree to which students feel confident about performing well in future situations (e.g., “I feel confident about my abilities”; “I feel as smart as others”, see Appendix B for full scale).

School Trust. Three items assessed to what extent students trust that adults in the school take care of them, and treat them justly (e.g., “At this school, students are supported”; “The adults at this school care about the students”, see Appendix B for full scale, Borman, Rozek, Pyne & Hanselman, 2019).

Identification with School. Two-items measured the degree to which a student mind doing well at the activities in school (e.g., “It is important for me to do well in school”; “I want to do well in school”, Borman, Rozek, Pyne & Hanselman, 2019).

Results

A 2 (students’ ethnicity: Syrian, Turkish) X 2 (intervention: general belonging, control) between subject analysis of variance (ANOVA) was conducted, with students’ mean scores on several measures (i.e., potential to succeed in school, social belonging in school, performance state self-esteem, school trust, and identification with school) serving as the dependent variables.

For potential to succeed in school, there was no main effect of students’ ethnicity, $F(1, 265) = 3.47, p = .064$, (Syrian students $M = 4.07, SD = .83, N = 131$ and Turkish students $M = 3.87, SD = .92, N = 138, d = .23$), and no main effect of intervention condition, $F(1, 265) = 3.28, p = .071$, (belonging intervention $M = 4.05, SD = .90, N = 141$; control condition $M = 3.88, SD = .85, N = 128, d = .19$). Thus, students’ potential to succeed in school is not increased neither by students’ ethnicity nor by intervention condition. However, these main effects were qualified with the interaction effect, $F(1, 265) = 6.33, p = .012$. As anticipated, a further analysis of simple effect of intervention condition within students’ ethnicity showed the intervention effect was significant for Syrian students $F(1, 265) = 9.15, p = .003$. That is, Syrian students have more potential to succeed in school after exposed to belonging intervention ($M = 4.30, SD = .73, N = 66$) compared to control condition ($M = 3.84, SD = .86, N = 65$), $d = .58$, (see Figure 1).

Figure 1

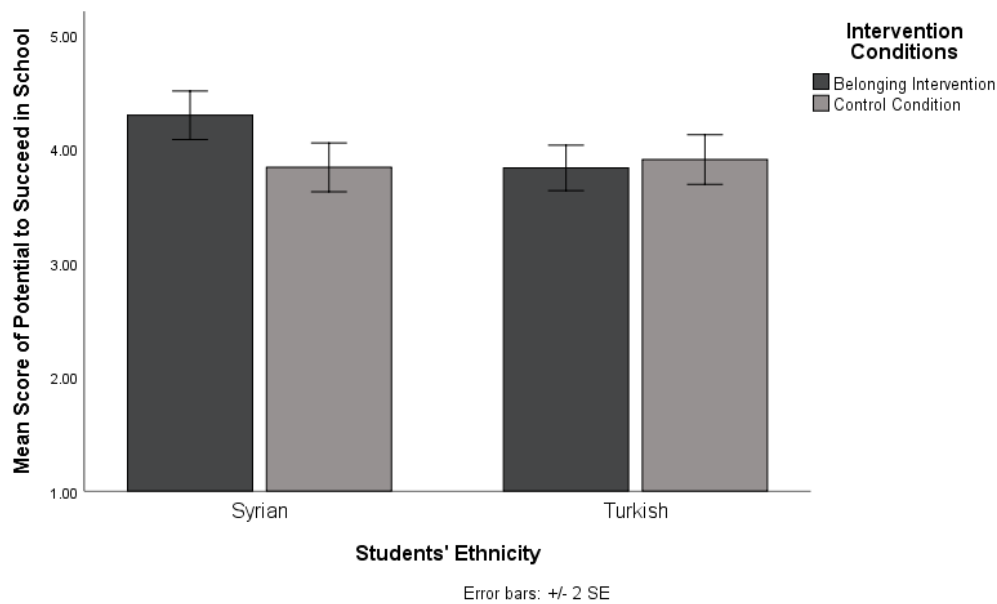


Figure 1.

Study 1: Students' mean score on potential to succeed in school as a function of students' ethnicity and intervention conditions.

There were no ethnic group differences for social belonging in school, $F(1, 265) = .99, p = .321$, (Syrian students $M = 3.40, SD = .94, N = 131$ and Turkish students $M = 3.50, SD = .72, N = 138, d = .12$), Syrian students' social belonging in school level was similar to that of Turkish students' level. There were no differences for intervention conditions as well, $F(1, 265) = 0.15, p = .903$, such that students in belonging intervention ($M = 3.45, SD = .78, N = 141$) and control conditions ($M = 3.46, SD = .89, N = 128$) did not differ in terms of social belonging in school measure, $d = .01$. There was no interaction between students' ethnicity and intervention conditions, $F(1, 265) = .079, p = .778$.

For performance state self-esteem, there was no main effect of students' ethnicity, $F(1, 265) = .030, p = .86$, (Syrian students $M = 3.65, SD = .68, N = 131$ and Turkish students $M = 3.66, SD = .78, N = 138, d = .01$), and no main effect of intervention condition, $F(1, 265) = 1.87, p = .173$, (belonging intervention $M = 3.71, SD = .74, N = 141$; control condition $M = 3.59, SD = .72, N = 128, d = .16$). Thus, students' performance state self-esteem scores are not

impacted neither by students' ethnicity nor by intervention condition. However, there was a significant interaction between students' nationality and intervention condition, $F(1, 265) = 4.70, p = .031$. A further analysis of simple effect of intervention condition within students' ethnicity revealed that the intervention effect was significant for Syrian students $F(1, 265) = 6.11, p = .014$. That is, the belonging intervention increased Syrian students' performance state self-esteem scores ($M = 3.80, SD = .62, N = 66$) compared to control condition ($M = 3.49, SD = .70, N = 65$), $d = .47$, (see Figure 2).

Figure 2

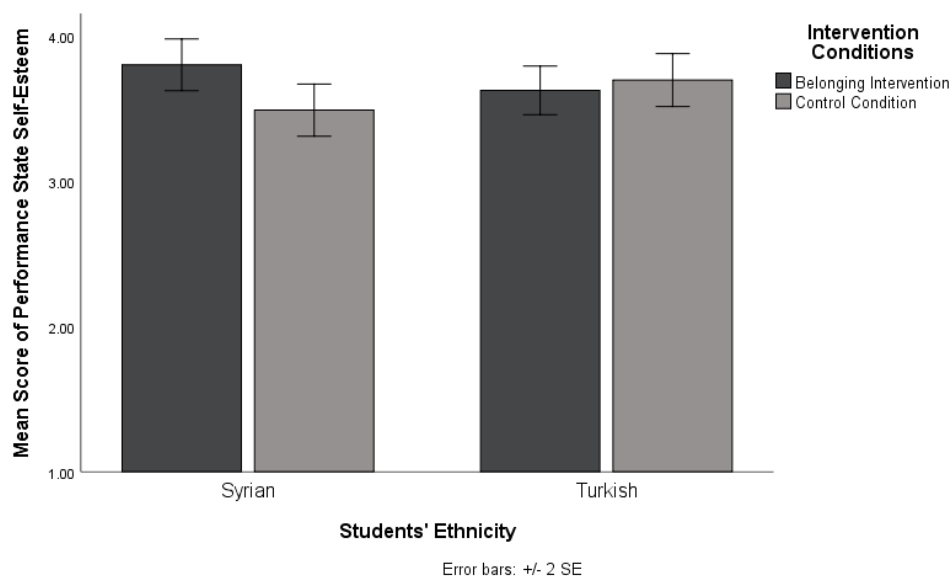


Figure 2.

Study 1: Students' mean score on performance state self-esteem as a function of students' ethnicity and intervention conditions.

School trust showed no differences in terms of ethnic group differences, $F(1, 264) = 2.18, p = .141$, (Syrian students $M = 3.30, SD = 1.18, N = 130$ and Turkish students $M = 3.50, SD = 1.17, N = 138, d = .0$), Syrian students' school trust scores was similar to that of Turkish students' scores. There were no differences for intervention conditions as well, $F(1, 264) = .321, p = .572$, such that the school trust scores of students in belonging intervention ($M = 3.44, SD = 1.14, N = 141$) and control conditions ($M = 3.36, SD = 1.22, N = 127$) did not

differ, $d = .07$. There was no interaction between students' ethnicity and intervention conditions, $F(1, 264) = 3.19, p = .075$.

For identification with school, there was no main effect of students' ethnicity, $F(1, 265) = .358, p = .550$, (Syrian students $M = 4.56, SD = .90, N = 131$ and Turkish students $M = 4.49, SD = .94, N = 138, d = .08$), and no main effect of intervention condition, $F(1, 265) = 2.42, p = .121$, (belonging intervention $M = 4.60, SD = .91, N = 141$; control condition $M = 4.44, SD = .94, N = 128, d = .17$). Thus, students' identification with school is not increased neither by students' ethnicity nor by intervention condition. However, these main effects were qualified with the interaction effect, $F(1, 265) = 5.09, p = .025$. A further analysis of simple effect of intervention condition within students' ethnicity showed the intervention effect was significant for Syrian students $F(1, 265) = 7.11, p = .008$. That is, Syrian students have higher identification with school after exposed to belonging intervention ($M = 4.77, SD = .73, N = 66$) compared to control condition ($M = 4.35, SD = 1.01, N = 65$), $d = .48$, (see Figure 3).

Figure 3

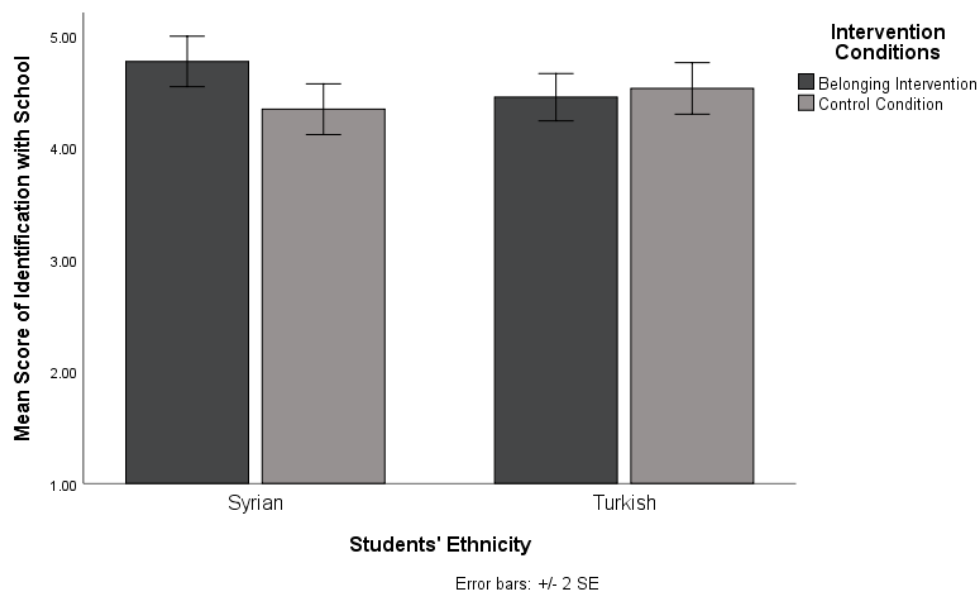


Figure 3.

Study 1: Students' mean score on identification with school as a function of students' ethnicity and intervention conditions.

Study 2

Syrian students heavily experience a language barrier during the integration process. (Seker & Sirkeci, 2015; Sahin & Sumer, 2018). It has been suggested that poor academic performance, low academic success, and overall integration process are associated with those students' lack of Turkish language skills, which obstruct the integration process (Seker & Sirkeci, 2015). To be optimally effective, the belonging intervention must address the disadvantaged students' current challenges in the given school context (Yeager et al., 2016). In the second study, the belonging intervention content was customized to focus on the language barrier (i.e., language-specific belonging intervention). The customized intervention approach presented students a story regarding the challenges that experienced in terms of language as shared by other refugee students, too and they are short-lived. We expect that Syrian refugee students who were exposed to the language-specific belonging intervention had more positive scores on the same targeted outcomes as in Study 1 than students under the control condition.

Methods

Participants and Design. Participants consisted of 263 sixth, seventh and eighth-grade middle school students (68 Syrian female, 66 Syrian male, 67 Turkish female, 62 Turkish male) from south-eastern Turkey. The specific criteria for eligibility included (1) students who were born in Syria, (2) students who have been living in Turkey for at least 1 year, and (3) students who are registered into the national Turkish education system. As in Study 1, before intervention implementation, all students were handed out a parental permission slip, and only students who returned the parent consent form participated in the research.

Sample size was calculated using g-power software with .80 statistical power using medium effect size that has been reported in similar studies of belonging intervention

(Walton & Cohen, 2011). Students were randomly assigned to language content-specific intervention or the control condition.

Procedures. The preparation process and the implementation of the interventions for the second study was the same as the first study. In the second study, students were randomly assigned to language content-specific intervention or the control condition. All students read a hypothetical report based on the results of a survey conducted with more senior Syrian and Turkish students who continue his/her education in Turkey (adapted from the original script of the intervention, Walton & Cohen, 2007; 2011). In the language content-specific intervention condition, the report included excerpts focused on how students had worried about their Turkish language proficiency (in terms of 4 components of language; reading, writing, listening, and speaking) in school during their first year but they became confident about their language competence through time. Language related concerns were reflected as commonly experienced by many students initially, however, those concerns were also shown as temporary which dissipate with time (See Appendix B for all excerpts). As in study 1, the intervention procedure was followed by the saying-is-believing task (Aronson et al., 2002; Walton & Cohen, 2011), in which students were asked to write an essay as long as they want in 15 minutes describing their own language-related experiences at school during the integrated process. In the control condition, as in study 1, students were exposed to physical environment related issues (e.g., school environment, city and weather). After completion of the manipulation part, all students were asked to complete the outcome measures (measures are same with study 1), and demographic questions (e.g., gender, age, grade, years living in Turkey). The experiment lasted approximately one hour.

Measures. Students completed 5 different measures (potential to succeed in school, social belonging in school, performance state self-esteem, school trust, and identification with school) in five-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*) used in the first

study (each measure was explained in the first study in detail). Cronbach's alpha value for each measure for the second study are provided in Table 1.

Results

A 2 (students' ethnicity: Syrian, Turkish) X 2 (intervention: language content-specific, control) between subject analysis of variance (ANOVA) was conducted, with students' mean scores on different measures (i.e., potential to succeed in school, social belonging in school, performance state self-esteem, school trust, and identification with school) serving as the dependent variables.

For potential succeed in school measure, there was a main effect of ethnicity, $F(1, 258) = 39.42, p = .000$, in which the mean score of potential to succeed in school for Syrian students ($M = 4.37, SD = .70, N = 135$) significantly higher than Turkish students ($M = 3.79, SD = .86, N = 127$), $d = .74$. We found no main effect of intervention, $F(1, 258) = .000, p = .997$, that is students' potential to succeed in school scores in language content-specific intervention condition ($M = 4.08, SD = .78, N = 134$) were similar to those students in control condition ($M = 4.10, SD = .89, N = 128$), $d = .02$. Significant interaction between students, ethnicity and intervention condition was found, $F(1, 258) = 13.32, p = .000$. A further of simple effect of intervention condition within students' ethnicity showed the intervention effect was significant for Syrian students $F(1, 258) = 6.90, p = .009$, that is students in the control ($M = 4.55, SD = .67, N = 67$) condition have higher potential to succeed in school than students in the language content-specific condition ($M = 4.20, SD = .70, N = 68$), $d = .51$. Simple effect of intervention condition within students' ethnicity showed the intervention effect was significant for Turkish students $F(1, 258) = 6.45, p = .012$, thus students in the language content-specific condition ($M = 3.95, SD = .85, N = 66$) have more potential to succeed in school than students in the control condition ($M = 3.61, SD = .84, N = 61$), $d = .40$ (see Figure 4).

Figure 4

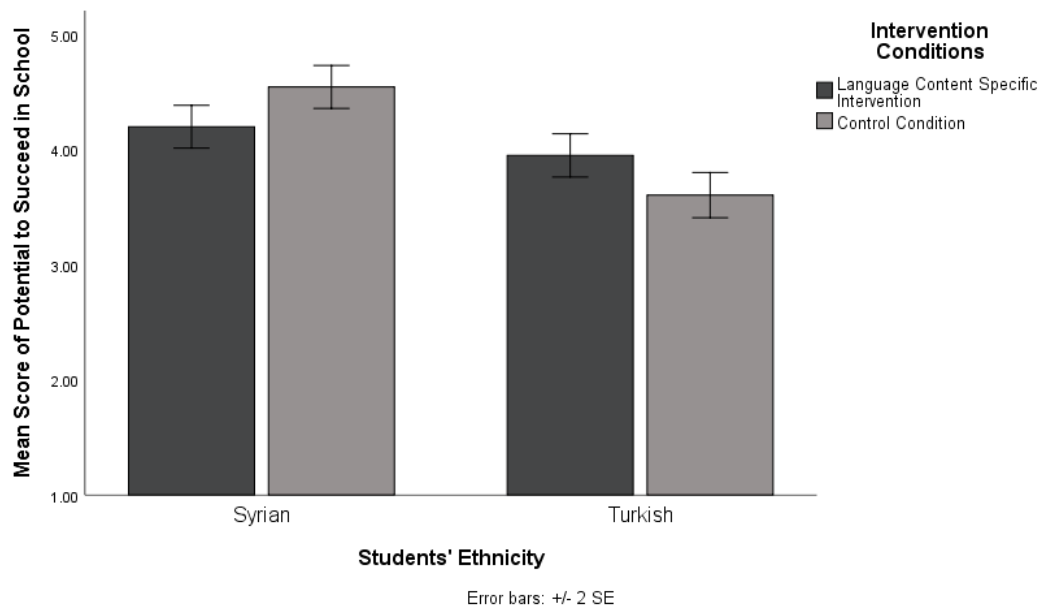


Figure 4.

Study 2: Students' mean score on potential to succeed in school as a function of students' ethnicity and intervention conditions.

Performance state self-esteem showed no differences in terms of ethnic group differences, $F(1, 260) = .407, p = .524$, (Syrian students $M = 3.76, SD = .67, N = 135$ and Turkish students $M = 3.70, SD = .70, N = 129, d = .08$), Syrian students' performance state self-esteem scores was similar to that of Turkish students' scores. There were no differences for intervention conditions as well, $F(1, 260) = .000, p = .989$, such that performance state self-esteem scores of students in language-content specific intervention ($M = 3.73, SD = .67, N = 136$) and control conditions ($M = 3.73, SD = .70, N = 128$) did not differ, $d = .0$. There was no interaction between students' ethnicity and intervention conditions, $F(1, 260) = .701, p = .403$.

For social belonging in school, there was no main effect of students' ethnicity, $F(1, 260) = .105, p = .747$, (Syrian students $M = 3.42, SD = .93, N = 135$ and Turkish students $M = 3.46, SD = .78, N = 129, d = .05$), however there was a main effect of intervention condition, $F(1, 260) = 10.12, p = .002$, (language content-specific intervention $M = 3.60, SD = .86, N =$

136; control condition $M = 3.27$, $SD = .82$, $N = 128$, $d = .39$). There was no significant interaction between students' nationality and intervention condition, $F(1, 265) = 4.70$, $p = .031$. An analysis of simple effect of intervention condition within students' ethnicity revealed that the intervention effect was significant for Syrian students $F(1, 260) = 6.81$, $p = .010$. That is, language content-specific intervention increased Syrian students' social belonging in school scores ($M = 3.61$, $SD = .91$, $N = 68$) compared to control condition ($M = 3.23$, $SD = .92$, $N = 67$), $d = .42$, (see Figure 5).

Figure 5

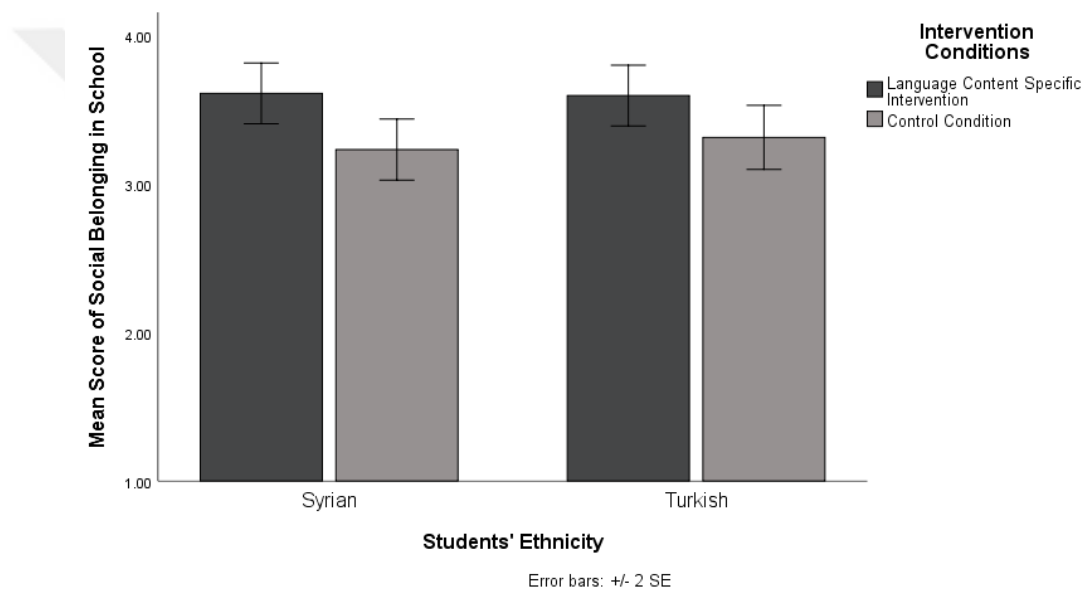


Figure 5.

Study 2: Students' mean score on social belonging in school as a function of students' ethnicity and intervention conditions.

There were significant ethnic group differences for school trust, $F(1, 260) = 6.64$, $p = .011$, (Syrian students $M = 2.82$ $SD = .94$, $N = 135$ and Turkish students $M = 3.14$, $SD = 1.09$, $N = 129$, $d = .31$), Syrian students' school trust level was similar to that of Turkish students' level. There were no differences for intervention conditions, $F(1, 260) = 2.98$, $p = .086$, such that students in language content-specific intervention ($M = 3.09$, $SD = 1.10$, $N = 136$) and control conditions ($M = 2.86$, $SD = .94$, $N = 128$) did not differ in terms of school trust, $d =$

.22. There was a significant interaction between students' ethnicity and intervention conditions, $F(1, 260) = 4.93, p = .027$. An analysis of simple effect of intervention condition within students' ethnicity demonstrated that the intervention effect was significant for Syrian students $F(1, 260) = 7.98, p = .005$. Thus, language content-specific intervention enhanced Syrian students' school trust ($M = 3.06, SD = .97, N = 68$) compared to control condition ($M = 2.57, SD = .84, N = 67$), $d = .54$, (see Figure 6).

Figure 6

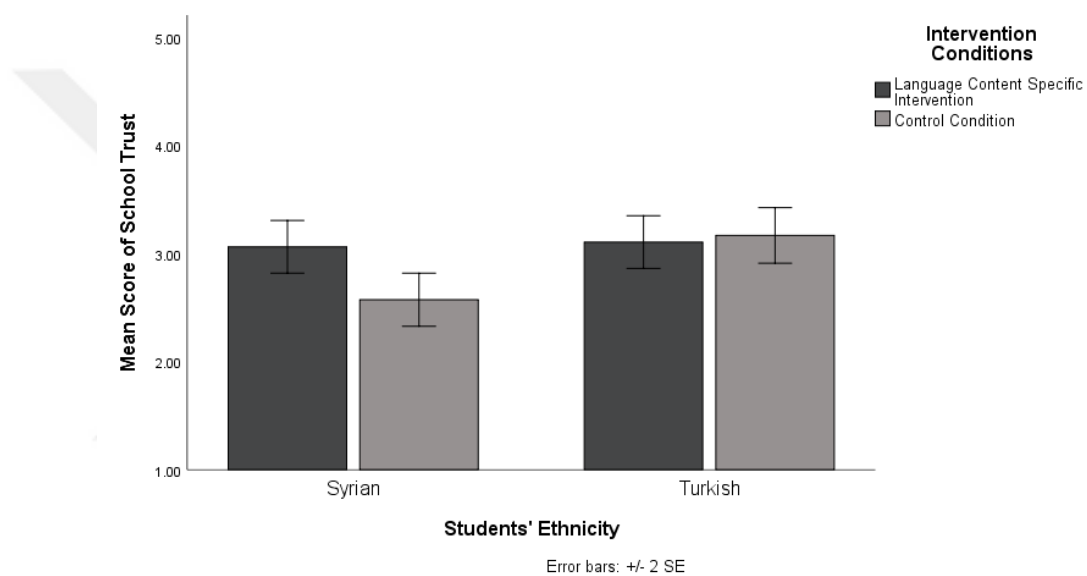


Figure 6.

Study 2: Students' mean score on school trust as a function of students' ethnicity and intervention conditions.

Finally, for identification with school, there was a main effect of students' ethnicity, $F(1, 260) = 4.34, p = .038$, (Syrian students $M = 4.68, SD = .68, N = 135$ and Turkish students $M = 4.50, SD = .82, N = 129, d = .24$), and no main effect of intervention condition, $F(1, 260) = 1.55, p = .214$, (language content-specific intervention $M = 4.64, SD = .71, N = 136$; control condition $M = 4.54, SD = .80, N = 128, d = .13$). There was a significant interaction between students' nationality and intervention condition, $F(1, 260) = 5.78, p = .017$. An analysis of simple effect of intervention condition within students' ethnicity showed that the

intervention effect was significant for Turkish students $F(1, 260) = 6.51, p = .011$. That is, the language content-specific intervention increased Turkish students' identification with their school ($M = 4.65, SD = .65, N = 68$) compared to control condition ($M = 4.32, SD = .94, N = 61$), $d = .47$, (see Figure 7).

Figure 7

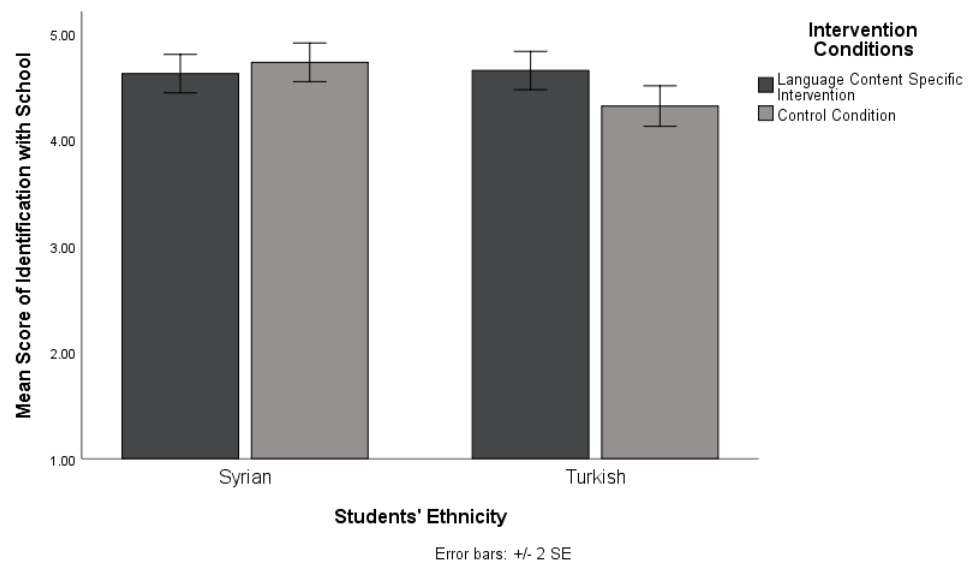


Figure 7.

Study 2: Students' mean score on identification with school as a function of students' ethnicity and intervention conditions.

General Discussion

The purpose of the present study was to test the customized versions of the social-belonging intervention that are specifically adapted to the refugee context, and this study represent the first evidence that social-belonging intervention improved the immediate attitudinal response of Syrian refugee students in a school setting. Study 1 revealed that standard social-belonging intervention (adapted to refugee middle school students' context), led Syrian refugee students to have higher potential to succeed in school, performance state self-esteem, and identification with school than their peers in the control condition. Interestingly, this study did not find an effect for the social-belonging intervention on social

belonging in school and school trust for refugee students, which were key findings by Borman et al., (2019). Further, we found that the social-belonging intervention had no significant positive impact on Turkish students in the first study, as it was expected. Social-belonging intervention is designed to resolve the question of sense of fit, which is more acute for minority students than majority students (Walton & Cohen, 2007). Thus, findings from this study support the notion that social-belonging intervention should be most effective for students who would like to belong in a particular school setting, however, question their belonging (Walton & Crum, in press).

In the second study, we tested the customized version of social belonging intervention namely language content specific belonging intervention. We observed that this customized version of social belonging intervention which addressed the language barrier improved social belonging in school and school trust of Syrian refugee students, however, did not yield significant results on performance state self-esteem and identification with school. Reverse effect was found for potential to succeed in school for Syrian refugee students, that is, control exercises led Syrian refugee students to have higher potential to succeed in school compared to language-content specific belonging intervention. These null and reverse findings are unexpected considered prior evidence of efficacy of adapted social belonging intervention (see Walton et al., 2015; Yeager et al., 2016; Goyer et al., 2019), nonetheless there may be some explanations of those findings. In the manual for customization of social belonging intervention (Walton et al., 2017), it has been suggested that researchers who want to adapt the existing social-belonging materials to new context (in our case it is refugee context) should assess the three important element (i.e., defining concerns and challenges of belonging, describing how students think and feel about challenges, and resolving the concern) of customization in a given context. Although previous studies demonstrated that language is the one of the most salient challenge experienced by Syrian refugee students

(Seker & Sirkeci, 2015; Sahin & Sumer, 2018), it is very possible that the resolution of language concern which threatens to belonging may not be received and understood by Syrian refugee students as intended.

Although it was not expected, second study revealed that Turkish students also benefitted from customized social belonging intervention in which language content specific belonging intervention led Turkish students to have higher potential to succeed in school and identification with school scores compared to control condition. Social belonging intervention conferred its various benefit mostly to minority students rather than majority students (Walton & Cohen, 2007), and it advantaged the individuals whose concern centers on sense of belonging. However, our findings do not imply that the motivation of minority students is more acute and crucial than the motivation of majority students in terms of sense of social belonging. Instead, majority students (in this case Turkish students) may benefit from customized social belonging intervention only because they feel themselves in an evaluative or comparative context (see Cohen et al., 1999). It has been suggested that when the sense of social belonging of majority students is explicitly challenged, majority group members' performance becomes salient (Walton & Cohen, 2003).

Implications

The present set of studies advanced both theoretical and practical implications of (customized) social belonging intervention. First, current studies are among the first refugee context based social belonging intervention aimed at addressing specific challenges faced by refugee students, to reduce the belonging uncertainty of Syrian refugee students in Turkey. Thus, adapting and testing social belonging intervention in refugee context contributes to understanding the variability in the effects of belonging intervention. Second, social belonging intervention emphasizes the centrality of sense of belonging to a particular setting for both maintained motivation and academic achievement. Previous studies mostly focused

on academic outcomes such as GPA (Walton & Cohen, 2007; 2011) however present studies revealed the effectiveness of customized social belonging intervention on immediate attitudinal outcomes (e.g., identification with school, see Borman et al., 2019) in a very new context. Thus, such findings also contribute the effectiveness of both standard and adapted social belonging intervention on diverse outcomes in diverse context.

Limitations and Future Directions

The present studies reinforce the importance of considering context-specific social belonging intervention to enhance the attitudinal responses of Syrian refugee students toward school, yet there are some limitations of the current studies. First, social belonging intervention was mostly tested on academic outcomes such as GPA or course grade (Walton & Cohen, 2007; 2011) we only measured the immediate behavioral outcomes in the current study and it was not possible to assess any administrative data of Syrian refugee student under current regulations, thus, further studies should test adapted social belonging intervention in refugee context in terms of academic outcomes such as GPA. Second, current study has relatively short time interval between administrative of interventions and measurement of intermediate outcomes. Some previous studies tested long term effect of social belonging intervention (Walton & Cohen, 2007; 2011; Walton et al., 2015; Yeager et al., 2016; Goyer et al., 2019; Brady et al., 2019) future studies should test if the positive impact of customized social belonging intervention for Syrian refugee students sustain for more distal outcomes such as middle school completion. Finally, as it has been suggested by Yeager and Walton (2011), social belonging intervention needs attentive customization in terms of context, thus, more studies are required into the processes that explain social belonging interventions and how they can be adapted and customized to correspond a variety of diverse contextual objectives.

Conclusions

One of the most damaging outcomes of war is children's education. In the present research we assessed the effectiveness of customized social belonging intervention for students who are effected war and resettled in Turkey. With this research we hoped to facilitate the transportability and adaptability of a brief and scalable social belonging intervention to Syrian refugee education context and advance the global scientific knowledge in an urgently in-need area and provide information to develop brief psychological strategies that can benefit the school performance and general well-being of an understudied population (Duncan, 2000; Lustig et al., 2004).



CHAPTER 5

GENERAL DISCUSSION

This dissertation aimed to investigate the effects of brief social psychological interventions on the academic and psychological outcomes of disadvantaged students. Closing academic achievement gaps (e.g., racial, gender) have long been an issue of especially western societies, which contain students from diverse backgrounds (see Cohen & Walton, 2006; 2009). Alongside the structural factors, both *stereotype threat* and *belonging uncertainty* being claimed to responsible from academic underperformance as psychological predicaments (Steele & Aronson, 1995; Walton & Cohen, 2007; 2011). Brief social psychological interventions target to close academic achievement gaps through shifting students' perception and attribution toward school to improve academic, psychological, and behavioral outcomes in the short- and the long-term. The most critical aspect of social psychological interventions is to deliver the intended message properly that is believed to help students to change their thoughts and feelings toward their school performance and school itself (Yeager & Walton, 2011). However, instead of merely presenting the message to the students, each intervention strategy allowed students to efficaciously engage in and produce the intervention itself (Yeager & Walton, 2011).

Before investigating those simple but remarkably effective brief strategies in Turkish educational context, it was necessary to explore their effectiveness considering different dimensions (e.g., intervention type, age-group, outcome variable). Therefore, in the second chapter, a systematic review is conducted including four different evidence-based social psychological interventions to understand the general criteria of maximizing their impacts among youth. Despite the effect size variation in magnitude through included 40 studies, it is obvious that BSPIs help negatively stigmatized students who are more susceptible to

stereotype threat and belonging uncertainty to improve their both academic and psychological outcomes.

There are a few prominent ideas in the second chapter that can shed light to the future research on the effectiveness of BSPIs. First, chapter II showed that BSPIs are not content and context free. Therefore, an important aspect of this systematic review is to understand to what extent it is necessary to blend different social psychological interventions to produce the maximum treatment effects for certain groups (Good et al., 2003; Schnabel et al., 2013). For example, it has been indicated that when values affirmation intervention specifically blended with the core aspect of the social belonging intervention's theme such as writing about important social bonds advanced performances (Schnabel et al., 2013). Furthermore, interventions address the similar underlying concern (e.g., decreasing stereotype threat) through targeting different processes, their combination led to produce additive effects (Good et al., 2003; Walton, Logel et al., 2015). For example, one research demonstrated that both social belonging and values affirmation interventions increased female STEM students' achievement through diverse processes which suggests the possibility of delivering the combination of different evidence-based interventions without violating the other's underlying message may bring greater impact (Walton, Logel et al., 2015). Second, it is essential to point out that the adaptation of BSPIs according to the context has shown significant gains for gender and minority achievement gaps. For example, Covarrubias et al. (2016) have revealed that values affirmation intervention brings the highest positive impact on middle school and college minority students' academic outcomes when the content of affirmation intervention is matched with their cultural background.

Although great evidence suggests that BSPIs are promising tools to mitigate the negative effects of stereotype threats and lack of sense of belonging among youth from middle school to college, yet there were studies, which were not able to replicate the positive

effects of these brief strategies (see Dee, 2015; Hanselman et al., 2017; Broda et al., 2018; Baker et al., 2020; Burnette et al., 2020; Bosch 2020). The very first possible explanation regarding the backfire of the interventions could be related with the interventions' design per se (Dee, 2015). For example, for the null findings of the values affirmation interventions among middle school students, rather than different pathways, similar processes may have been triggered by both affirmation and control exercises (Dee, 2015). Similarly, growth mindset intervention strategy is also suffered from the inconsistent results of its effectiveness (Yeager et al., 2016; Rhee & Johnson, 2019; Burnette et al., 2020), and it has been suggested that the effect of growth mindset intervention may dampen, if any procedure similar to growth mindset is followed by the school authorities (Yeager et al., 2016). Even though, the null findings of BSPIs suggest that these approaches have turned to negative effects betimes, nonetheless, they have both immediate and vicarious consequences for various age groups (e.g., middle school, college) achievement gaps (e.g., gender, racial), and measured outcomes (e.g., GPA, course grade, sense of belonging)

These inconsistent findings regarding the effectiveness of BSPIs result in the need for specifically tailored, contextually adapted and customized interventions to respond the needs of different group of people with a diverse background (Yeager & Walton, 2011).

In the light of these discussions, chapter III have tested the effectiveness of adapted values affirmation intervention (i.e., group values affirmation) and the moderator role of gender group identification on female STEM students' mental task performance (Cetinkaya et al., 2020). The results of these studies have shown that values affirmation intervention as an evidence-based stereotype threat intervention mitigated the pernicious effect of group focused stereotype threat when it is modified to target group values instead of self-focused values. It has been also shown that group values affirmation work effectively only against salient stereotype threat, rather than its assumption. Chapter III also tested the moderation

role of identification with gender group and indicated that highly gender identified female STEM students benefitted from group values affirmation more than other conditions including self and control affirmations.

Chapter IV tested the effectiveness of customized social belonging intervention on educational outcomes of Syrian refugee middle school students to mitigate their integration stressors. The results of this chapter had revealed that Syrian refugee middle school students' potential to succeed in school, performance state self-esteem, and identification with school were supported when they exposed to adapted social belonging intervention compared to control exercise for the first study and social belonging in school and school trust for the second study. These findings provide more evidence on the importance of customized social psychological interventions to increase their effectiveness in non-tested contexts.

The current set of studies advances BSPIs literature in many important aspects. First, the substantive importance of Multi Stereotype Threat framework was ignored by the previous studies in the sense of brief strategies' effectiveness (see Shapiro & Neuberg, 2007; Shapiro et al., 2013). Stereotype threat was mostly threatened as single construct and being claimed to be experienced same across individuals, groups, and situations. However, the findings of the chapter III have contributed to the effectiveness of BSPIs which can show differentiation following to different stereotype threats targeting diverse abilities (either personal or group; Shapiro et al., 2013). Second, BSPIs literature put forwarded the significant effect of customized interventions according to the given context to have the greatest benefit for disadvantaged students. In the light of these evidence, our studies contributed to the importance of adapted and customized interventions. We tested the adaptation and customization of the well-known values affirmation (chapter III) and social belonging (chapter IV) interventions to gain the optimal consequences for certain groups. Third, to advance and contribute to the practical implications of the interventions, we

demonstrated for whom the intervention would work the best to act upon the effectiveness of interventions one step further (chapter III). Finally, the effectiveness of BSPIs have been mostly tested in Western societies, however we know little about their effectiveness in different than where they originated. Therefore, testing their effectiveness in Turkish educational context for a group of students with a different background and story, contributed the strength, robustness, culturally appropriateness of the BSPIs.

Inequality between different social groups such as between men and women students in STEM fields or between minority and majority students in terms of both achievement and opportunities, persists and proceeds as an important social problem in educational context. I hope, this dissertation inspires future research initiatives which will strengthen the researcher-practitioner network to generate new knowledge and bring approaches to contribute educational equalities. Additionally, I believe, it will provide an insight into the causes of gender and minority disparities to understand the specific challenges that disadvantaged students face throughout their academic life and enable future research *not* to consider the social problems independent from *context* which is substantially important to correctly identify these specific barriers and disseminate the research-based solutions for them. Furthermore, this dissertation will recognize the mutual benefit between scientific research and practice to build collaboration with organizational partners who are motivated to make progress on world's toughest concerns for public impact and enable future research initiatives to communicate with non-academic audiences as well as academic audiences to create broader public change. Finally, the long-term goal of this dissertation serves to promote a better society with creating more equitable environments in the educational domain.

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