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How to Say “No” Most Effectively: Evaluating Resistance Strategies for Prescription Stimulant Diversion to Inform Preventive Interventions

Laura J. Holt^a, Ty S. Schepis^b, Alison Looby^c, Eliza Marsh^{a,1}, Paige Marut^d, Richard Feinn^e

^aDepartment of Psychology, Trinity College, 300 Summit Street, Hartford, CT 06106 United States

^bDepartment of Psychology, Texas State University, 601 University Drive, San Marcos, TX 78666 United States

^cDepartment of Psychology, University of Wyoming, 1000 E. University Avenue, Laramie, WY 82071 United States

^dDepartment of Psychiatry, Yale University School of Medicine, 1 Church Street, New Haven, CT 06510 United States

^eFrank H. Netter School of Medicine, Quinnipiac University, 370 Bassett Rd, North Haven, CT 06473 United States

Abstract

Objective—We evaluated the perceived effectiveness of resistance strategies students could employ if approached to give away, trade, or sell their prescription stimulant medication, a growing concern on college campuses.

Participants—We sampled undergraduates ($N=1521$) at three demographically dissimilar institutions between Fall 2017-Spring 2018.

Methods—We administered an anonymous, online survey and used linear mixed models to examine the effects of strategy type, face support (i.e., adding politeness), and substance use history on perceived strategy effectiveness.

Results—Internal (e.g., “I am not comfortable sharing my medication”) and external (e.g., “My doctor won’t prescribe me if I share”) explanations were perceived to be most effective. Excuses, direct refusals, and suggesting an alternative (e.g., energy drink) were less preferred. Adding face support improved perceived effectiveness for direct refusals and internal explanations.

Conclusions—Preventive interventions for stimulant diversion could encourage the use of internal or external explanations or direct refusals with face support.

¹Eliza Marsh is now with Butler Hospital and The Alpert Medical School of Brown University, 345 Blackstone Blvd., Providence, RI 02906 United States (EMarsh@butler.org)

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Keywords

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The non-medical use of prescription stimulants (NMUPS), or the use of stimulants in ways that are not prescribed, has increased steadily over the past decade among emerging adults and is associated with several poor outcomes (e.g., illicit substance use, lower academic achievement, psychiatric symptoms).^{1–4} NMUPS can produce serious medical consequences, as indicated by the 156% increase in emergency room visits from non-medical Adderall use from 2006–2011.⁵ Most emerging adults engaged in NMUPS obtain stimulants from friends, peers, or acquaintances with prescriptions.⁶ Epidemiological research corroborates this: as stimulant prescriptions increased between 2003–2013, rates of NMUPS and stimulant diversion (i.e., selling, sharing, or trading medication) similarly increased.² Indeed, up to one-half of college students prescribed stimulants report lifetime diversion,^{7–10} higher than rates of other medication diversion among students.⁹ Thus, preventing prescription stimulant diversion would reduce the stimulant supply for NMUPS and associated negative sequelae, though research evaluating preventive interventions for stimulant diversion is lacking.

Pressure from peers to share or sell one's stimulant medication is common but has been given surprisingly little research attention. A recent study found that 58% of students with a stimulant prescription were asked to divert; further, the frequency and intensity of diversion requests uniquely predicted diversion.¹¹ There are several reasons why individuals with ADHD, the subpopulation prescribed stimulants most often, may be especially vulnerable to requests for their medication and for complying with those requests. Adolescents with ADHD report fewer close friends and have been shown to experience more challenges interacting with peers and more instances of being rejected by peers.¹² Coupled with the fact that impulsivity is a hallmark of ADHD, students with ADHD and prescription stimulant medication may be prone to complying with requests for their medication to avoid conflict or rejection from peers.¹³ Consistent with these ideas, adolescents with ADHD who diverted their medication experienced 4.5 times more overt and relational peer victimization versus peers without ADHD.¹³ As students with ADHD experience greater challenges interacting with peers and limited social support,^{12–13} they are likely to be prime targets for diversion requests. In such cases, they are faced with the dilemma of complying and potentially forgoing their treatment, or refusing the request and risking relational conflict and/or a loss of social status.¹⁴

Enhancing *social influence resistance strategies* could help students better refuse stimulant diversion requests. Taught through instruction, modeling, and role-play, these strategies can help students recognize and resist influences to engage in substance use and anticipate potential interpersonal challenges when resisting.¹⁵ Limited research has examined social influence resistance strategies among college students. Two lab-based simulations examined the efficacy of four strategies to resist persuasions to consume alcohol: (1) *explanations* (e.g., “I don’t like the taste of alcohol”); (2) *excuses* (e.g., “I can’t drink because I have to

get up early”); (3) *direct refusals* (e.g., “No, I don’t do that”); and (4) *alternatives* (e.g., “I’ll have a soda instead”).^{16–17} All strategies were equally effective at preventing follow-up offers of alcohol, suggesting that simply using a resistance strategy may be most important. However, a real-world study on resisting offers of drugs found that direct refusals and alternatives were most effective.¹⁸ These strategies were least likely to result in additional pressure, although suggesting alternatives was used infrequently. Of note, participants’ choice of resistance strategy varied with their substance use history, as students who had never tried drugs were more likely to use direct refusals than those who used occasionally or regularly.¹⁸ These findings indicate that different resistance strategies may not be uniformly palatable to all students. Substance use behavior, in particular, likely is influential in determining what resistance strategies one employs and possibly how one responds to others’ resistance.

While the above research has added to our understanding of efficacious ways to resist pressure to use substances, there are no studies (to our knowledge) that have assessed the most effective ways to resist pressure to share or distribute substances. Accordingly, our study aims to fill this gap by examining whether the strategies that are effective to resist substance use also are effective in a different context (i.e., stimulant diversion requests). On the one hand, prescription stimulants are similar to alcohol and other illicit drugs in that they can be used to get high and enhance social experiences; on the other hand, since they are most often used for academic enhancement and are viewed as more socially acceptable compared to marijuana and cocaine (DeSantis & Hane, 2010), resisting requests for one’s medication may pose a significant social liability.

Prior research also is limited by the fact that it has not differentiated between internally- (e.g., “I just don’t like the taste of alcohol”) and externally-motivated explanations (e.g., “I can’t drink because I am on medication”).¹⁶ Internally-motivated refusals may be more effective at stopping future offers,¹⁹ though external explanations may better preserve interpersonal harmony.²⁰ Another means of mitigating interpersonal risk is through “face support,” or added politeness and/or expressions of validation or empathy.^{16–17} Harrington found less reported relational damage when the person resisting added face support, without a corresponding increase in future persuasive attempts.¹⁶ Although face support may make resistance attempts more palatable, it is unknown if these findings apply to requests for stimulant diversion.

Aims and Hypotheses of the Current Study

Our primary aim was to assess the perceived efficacy of resistance strategies used to prevent stimulant diversion. Our second and third aims, respectively, were to determine whether adding face support to the resistance strategies changed their perceived efficacy and whether a history of NMUPS (or being at-risk for NMUPS) altered responses to the resistance strategies. Our final aim was to determine which resistance strategies students with stimulant prescriptions preferred to use. Because of the lack of previous research, we did not advance hypotheses regarding which resistance strategy(ies) would be perceived as most effective overall (i.e., most likely to stop future requests *and* least likely to negatively affect the relationship), nor about which strategy(ies) prescribed students preferred. However, we did

hypothesize that when examining our two key outcomes (i.e., likelihood of stopping future requests, likelihood of harming the relationship) separately, participants would perceive direct refusals to be most effective at stopping future diversion requests, but also most harmful to the requestor-requestee relationship. Finally, we hypothesized that participants with a NMUPS history would rate all resistance strategies as less effective than those without a history, given that users likely obtained diverted stimulants previously and may not view resistance attempts as impeding.

Methods

Participants and Procedure

Participants were 1521 undergraduates from three US universities located in the Southwestern, Mountain, and Northeastern United States. Table 1 provides detail about the demographics of our sample. We recruited participants for an anonymous online survey through class visits, Psychology subject pools, campus flyering, and a survey link distributed via e-mail to a random selection of students (Northeast site only). We obtained informed consent at the beginning of the survey and approval from the Institutional Review Boards at all three sites. Participants could earn course credit or entry into a drawing for a gift card to an online merchant. Data were collected during the Fall 2017 and Spring 2018.

In order to assess possible differential responses to resistance strategies, we classified participants into three risk groups based on previous research:^{21–23} *Non-medical users* endorsed NMUPS at least once in college. *At-risk non-users* needed to meet two criteria: (1) at least two demographic NMUPS risk factors: male gender, Greek involvement, GPA<3.5, past-two-week binge drinking, or past-month marijuana use; and (2) at least one NMUPS-specific risk factor: any intention to use in the next 6 months, or any diminished avoidance self-efficacy. *Low risk non-users* did not meet the criteria for at-risk non-users.

Measures

Substance use, expectancies, intentions, and avoidance self-efficacy—

Participants reported whether they had engaged in past-month marijuana use and past two-week binge drinking. Participants also reported whether they had ever engaged in NMUPS while in college, frequency of NMUPS, and route(s) of administration (e.g., oral, intranasal, injection). Behavioral intentions to engage in NMUPS or medical misuse (i.e., take more than is prescribed) were assessed via a modified question from the Behaviors, Expectancies, Attitudes and College Health Questionnaire (BEACH-Q).²⁴ The question was modified to include a six-month timeframe and response options similar to LaBrie and colleagues' intentions to drink measure (0=*not at all* to 100=*extremely likely*).²⁵ We assessed avoidance self-efficacy via another item from the BEACH-Q: "If you had a lot of school work to do in a short amount of time, how confident are you that you would NOT misuse prescription stimulants to help you finish your work?" (1=*not at all confident* to 5=*completely confident*).

ADHD diagnosis, prescription status, and symptomatology—Participants indicated if they had ever been formally diagnosed with ADHD/ADD and/or if they were currently prescribed stimulants. The 18-item Adult ADHD Self-Report Scale Symptom

Checklist (ASRS) assessed ADHD symptoms over the past six months, with excellent reliability ($\alpha=.92$).²⁵

Diversion scenarios and resistance statements—All participants read vignettes in which they imagined they were asking a close friend with a legitimate prescription for his/her stimulant medication. Although the vignettes were created by the authors (see Appendix A), they were based on five different scenarios described and tested in previous research.^{11,27} These scenarios were: (1) *rational-academic* (i.e., stimulants to accomplish an academic task); *rational-recreational* (i.e., stimulants for partying/social purposes); *promise* (i.e., stimulants in return for someone else); *direct request* (i.e., simple request with no explanation); and *negative feelings* (i.e., requester makes the prescription holder feel guilty for noncompliance). Previous research established both the internal consistency and predictive validity of this measure; specifically, greater collective exposure to these situations was associated with a greater risk of diverting one's stimulant medication.¹¹

For each scenario, participants evaluated ten resistance statements, with two statements corresponding to each of the five resistance strategies: (1) direct refusal (e.g., “not happening”); (2) alternative (e.g., “I can't give you any of my meds, but maybe a few espresso shots or an energy drink would give you a decent buzz?”); (3) excuse (e.g., “I don't have any with me right now, and I'm kind of in a hurry”); (4) internal explanation (e.g., “I can't share my medication. I don't want to risk being short any pills, especially with midterms coming up”); and (5) external explanation (e.g., “My parents keep track of my prescription because they send it to me, so I can't share any”) (see Appendix B). There was one additional alternative for the *rational-academic* scenario where the participant offered to help with studying, a potentially palatable alternative if a student requests medication for academic concerns. The resistance strategies used in the current study were similar to those used by researchers examining the efficacy of refusals for offers of substances^{16–18}; however, they were adapted for the current study to reflect *resistance to diversion* specifically.

Relationship preservation ratings: After each of the resistance statements, participants reported how favorably they would feel towards a friend who responded to them in that way (1=*very unfavorably* to 5=*very favorably*). Higher scores denoted a more favorable response to the person resisting diversion for that resistance strategy. Reliabilities for the relationship preservation ratings for each of the strategies were excellent ($\alpha=.95$ for direct refusal, external explanation; $\alpha=.94$ for excuse, internal explanation; $\alpha=.91$ for alternative).

Resistance strategy effectiveness ratings: To assess perceived resistance strategy effectiveness, participants reported how likely they would be to request stimulants again from this friend following use of each strategy (1=*very unlikely* to 5=*very likely*). Items were reverse scored so that higher scores indicated the strategy was better at deterring future requests. Reliabilities for the effectiveness ratings for each of the strategies were excellent ($\alpha=.95$ for direct refusal, excuse, internal explanation, alternative; $\alpha=.96$ for external explanation).

Composite strategy effectiveness ratings: For each resistance strategy, we summed the mean relationship preservation and mean effectiveness ratings. Thus, the mean scores for each strategy could range from 2 (least effective at preserving interpersonal harmony *and* discouraging future requests) to 8 (most effective at preserving interpersonal harmony *and* discouraging future requests). Reliabilities for each of the resistance strategy composites were excellent ($\alpha=.95$ for direct refusal, excuse, internal/external explanations; $\alpha=.94$ for alternative).

Face support—One resistance statement for each of the five strategies across the five scenarios included face support; the other statement did not. For example, a direct refusal with face support was “Sorry, I am usually dragging later in the day too, but I don’t do that.” Conversely, a direct refusal without face support was “Not happening.” When examining the effect of face support on overall strategy effectiveness, we created a composite of all of resistance strategies with face support and all without. The reliabilities for both scales were excellent ($\alpha=.96$).

Resistance strategies preferred by prescribed students—Only students with current or past-year prescriptions were asked to imagine that a friend or acquaintance, also with a stimulant prescription, asked for their medication and promised to share his/her medication upon getting a refill. We focused on this specific scenario because giving away one’s medication to someone who has run out of his/her prescription was the second most common motive reported for diversion, after helping someone under academic stress.²⁸ Students were to assume that they did not want to divert and rated the likelihood they would use each resistance statement (1=*not at all* to 5=*very likely*). Two resistance strategies were presented for each scenario, for a total of ten strategies. The resistance statements were identical to the ones presented to all participants, with the exception of the alternative statement, which encouraged the requester “to speak with his/her prescriber” (see Appendix B). Each pair of items for each of the five resistance statements correlated significantly (all p s < .05): direct refusal $r = .48$; alternative $r = .34$; excuse $r = .45$; internal explanation $r = .30$; external explanation $r = .59$.

Data Analysis Plan

To test for demographic differences in the study variables by the three risk groups, we used Chi-square tests for categorical variables (e.g., gender) and analyses of variance (ANOVAs) for continuous variables (e.g., ADHD symptoms). For all analyses involving variables with more than two levels, we conducted pairwise comparisons with a Bonferroni correction and only reported pairwise comparisons as significant if $p < .05$ with this correction. In cases where the cell sizes were too small for Chi-square tests (e.g., participants identifying as transgender), our analyses only included groups for which there was a sufficient number of respondents (≥ 5) in each cell.

To determine which strategies were perceived as most and least effective overall, a linear mixed model analysis assessed for main and/or interaction effects of Strategy Type, Risk Group, and Face Support on overall strategy effectiveness, which was a composite of the relationship preservation and effectiveness ratings. The model included one between-

subjects variable, Risk Group (Non-user, At-risk Non-User, Non-Medical User), and two within-subjects variables, Strategy Type (Direct Refusal, Alternative, Promise, Internal Explanation, External Explanation) and Face Support (Yes/No). This analysis also allowed us to test our hypotheses regarding the effects of risk group and face support on strategy ratings.

To test our hypothesis that direct refusals would be more effective than other types of refusals at stopping future medication requests, we used linear mixed model analysis. We included Strategy Type in this model, but a different within-subjects variable, namely Outcome Type (Relationship Preservation or Effectiveness), which enabled us to examine relationship preservation and effectiveness ratings separately. Finally, to address which of the five resistance strategies were most/least preferred among prescribed students only when approached by other prescribed students, we used another linear mixed model analysis with one within-subjects variable (Strategy Type).

Power was calculated for our hypothesis examining whether the overall effectiveness of strategy type differed by risk group. The model used for power was a repeated measures with one between-subject factor with 3 levels (i.e., Risk group) and one within-subject factor with 5 levels (i.e., Strategy type). Assuming a correlation of $r = 0.5$ between strategy type levels, an alpha level of 0.05, and a sample size of 1500, the power to detect a small effect (standardized difference $d = 0.2$) between one level of risk group versus the other two levels was 0.99. The power to detect a small effect between one strategy versus the other four was 0.99, and the power to detect a small interaction effect between group and strategy was 0.93.

Results

Approximately one-fifth (19%) of the sample was classified as *non-medical users*, since they endorsed NMUPS at some point in college. The next group, *at-risk non-users*, comprised 22% of the sample. Finally, *low risk non-users* comprised over half the sample (58%). We did not create a separate group for students with stimulant prescriptions ($n=117$), as a preliminary examination of these students showed that they were heterogeneous in their endorsement of risk factors and NMUPS (33% low-risk non-users, 43% at-risk non-users, 24% non-medical users); therefore, combining them might have obscured important differences in their reactions to the resistance strategies.

Chi-square tests and pairwise comparisons showed a greater percentage of males [$\chi^2(2)=88.34, p < .001$], senior students [$\chi^2(6)=57.60, p < .001$], students from the Northeast site [$\chi^2(4)=50.31, p < .001$], and students with Greek affiliation [$\chi^2(2)=50.31, p < .001$] in the non-medical use group. At-risk non-users were most likely to endorse having an ADHD diagnosis [$\chi^2(2)=25.39, p < .001$] and a stimulant prescription [$\chi^2(2)=39.31, p < .001$]. At-risk non-users endorsed a similar level of ADHD symptoms compared to non-medical users; both groups reported more symptomatology than low-risk non-users [$F_{(2, 1503)}=45.51, p < .001$]. Table 1 displays descriptive statistics by group.

Table 2 displays the means, standard deviations, and correlations among the five resistance strategy types by students' prescription status. For the overall sample, students' ratings of all

five resistance strategies correlated significantly. Similarly, for prescribed students, the likelihood of using any one of the strategies was positively correlated with the likelihood of using one of the other four strategies.

Effects of Strategy Type, Risk Group, and Face Support on Overall Strategy Effectiveness

Results from the linear mixed model analysis showed main effects of strategy type, $F_{(4, 5945.83)} = 227.15$, $p < .001$, and risk group, $F_{(2, 1490.78)} = 37.77$, $p < .001$, and an interaction between strategy type and face support, $F_{(4, 7431.41)} = 154.38$, $p < .001$. We found support for our first hypothesis, namely that non-medical users would rate the resistance strategies as less effective overall [Estimated marginal mean: $EMM(SE) = 6.94(.07)$] compared to low-risk non-users [$EMM(SE) = 7.50(.04)$]. Pairwise comparisons showed that at-risk non-users' scores [$EMM(SE) = 6.94(.07)$] were nearly identical to non-medical users (see Figure 1). With respect to strategy type, pairwise comparisons showed that internal [$EMM(SE) = 7.36(.04)$] and external explanations [$EMM(SE) = 7.38(.04)$] were perceived as most effective; direct refusals [$EMM(SE) = 7.11(.04)$] and alternatives [$EMM(SE) = 7.11(.04)$] were intermediately effective; and excuses were perceived as least effective [$EMM(SE) = 6.68(.04)$].

Additionally, pairwise comparisons showed that direct refusals were significantly more effective with face support [$EMM(SE) = 7.27(.04)$] than without [$M(SE) = 6.95(.04)$]; the same was true for internal explanations [$EMM(SE) = 7.50(.04)$ vs. $7.22(.04)$]. On the other hand, alternatives were perceived as less effective with the addition of face support [$EMM(SE) = 6.92(.04)$ vs. $7.30(.04)$], as were excuses with face support [$EMM(SE) = 6.56(.04)$ vs. $6.80(.04)$]. There was no difference for external explanations, nor was there an overall main effect of face support [$EMM(SE) = 7.13(.04)$ strategies with face support vs. $7.12(.04)$ strategies without face support]. Figure 2 displays the estimated marginal means for each resistance strategy with and without face support.

Differential Effects of Strategy Type on Relationship Preservation and Effectiveness

We found a significant interaction between strategy type and outcome type, $F_{(4, 12097.91)} = 155.18$, $p < .001$. Participants perceived direct refusals as most effective at discouraging future requests [$EMM(SE) = 4.12(.02)$], supporting our hypothesis. However, an examination of the 95% confidence intervals suggested that internal [$EMM(SE) = 4.08(.02)$] and external explanations [$EMM(SE) = 4.12(.02)$] were not significantly different from direct refusals, so direct refusals did not confer an advantage over these other types of resistance. As hypothesized, direct refusals were perceived to affect relationships more negatively than all of the other resistance strategies [$EMM(SE) = 3.17(.02)$], with the exception of excuses [$EMM(SE) = 3.17(.02)$], which were assessed to be equally problematic to the relationship.

Contrasts showed that for each of the five resistance strategies, mean effectiveness scores were higher than the mean scores for relationship preservation (direct refusal $t = -31.60$; alternative $t = -17.70$; internal explanation $t = -21.53$; external explanation $t = -23.92$; excuse $t = -15.10$, all $ps < .001$). That is, all strategies were assessed to have a greater "relationship cost" when compared to perceived effectiveness. As we predicted, the

discrepancy was largest for direct refusals, as evidenced by the fact that the 95% confidence intervals [lower = -1.01, upper = -.89] did not overlap with the confidence intervals of the other four strategies. Figure 3 depicts the estimated marginal means for how participants assessed each strategy on relationship preservation and effectiveness, respectively.

Strategies Preferred by Prescribed Students

A linear mixed model analysis found differences with respect to the resistance strategies students with stimulant prescriptions were most likely to use when approached by other students with a stimulant prescription. There was an effect of strategy type, $F_{(4, 464)} = 18.32$, $p < .001$. Pairwise comparisons showed that excuses [$EMM(SE) = 3.32(.11)$], alternatives [$EMM(SE) = 3.01(.11)$], and internal explanations [$EMM(SE) = 3.21(.11)$] were preferred most often. Direct refusals were intermediate [$EMM(SE) = 2.91(.11)$] and external explanations were preferred least [$EMM(SE) = 2.45(.11)$] (see Figure 4).

Comment

This study aimed to identify which resistance strategies were perceived as maximally effective at preventing follow-up requests for stimulant medication diversion while preserving the relationship between a student with a prescription and the person requesting medication. Although prior research has identified effective strategies to resist offers of alcohol and drugs, the current study is the first attempt to examine the most effective ways to resist requests to share or distribute substances, specifically prescription stimulants. Moreover, it is the first study to examine the perceived efficacy of these resistance strategies by NMUPS risk/history and stimulant prescription status.

We found support for our hypothesis that non-medical users would rate resistance strategies as less effective overall compared to low-risk non-users. These students might find resistance strategies less compelling and more problematic interpersonally, given their previous success obtaining stimulant medication for NMUPS. Notably, at-risk non-users' overall effectiveness ratings were nearly identical to non-medical users' ratings, suggesting that students with any NMUPS risk factors may be less likely to accept a peer's refusal and perceive different social consequences to such refusals.

Although risk group was associated with participants' overall ratings of the resistance strategies, preference for specific resistance strategies did not vary by risk group. These findings contrast with Hecht and colleagues, where substance use history was associated with a preference for different types of refusal strategies.¹⁸ In this study, internal and external explanations had the highest composite ratings for perceived effectiveness and relationship preservation. Excuses, on the other hand, had the lowest composite effectiveness score. These findings differ from laboratory research on refusals of alcohol, in which varying strategies were equally likely to prevent additional requests.¹⁶⁻¹⁷ Our findings also differ from Hecht and colleagues, who showed that direct refusals and alternatives were most effective.¹⁸ It is not surprising that our findings differed, however, since we examined how to best resist pressure to share or distribute substances, as opposed to pressure to use substances. We also accounted for relationship preservation and effectiveness, focused on a

prescription drug rather than a recreational drug, and utilized a different methodology to probe students' reactions to resistance.

It was notable that when we compared ratings of relationship preservation for the strategies overall with their ratings of perceived strategy effectiveness, participants judged *all* strategies as more effective at preventing future requests, as opposed to preserving the relationship. These findings suggest that, even if students are knowledgeable about resistance strategies, their concerns about relationship preservation may deter them from implementing those strategies. And, since students with ADHD are more likely to face difficulties establishing and maintaining relationships compared to peers without the disorder,^{12–13} they might be especially concerned about the consequences of resisting requests for stimulants, resulting in an increased likelihood of diversion.

As hypothesized, participants perceived direct refusals to be problematic to relationship preservation; however, the addition of face support improved perceptions of overall effectiveness. The same was true for internal explanations. Therefore, prescribed students may consider adding face support when using these strategies to resist requests, especially direct refusals, since they were considered most problematic for relationship preservation. Direct refusals are blunt, so face support may act as a buffer, making them more palatable and decreasing the possibility of relationship harm. Internal explanations also may have been perceived more favorably with face support because this type of explanation implies a personal choice not to divert (e.g. "I don't want to be short on pills"); thus, an apology may soften the idea that one is volitionally refusing a friend/peer. On the other hand, participants perceived alternatives and excuses as *less* effective with the inclusion of face support. In these circumstances, adding politeness may lead the person making the request to think that the student with the prescription is even more disingenuous, since both strategies on their own are diversionary tactics.

Finally, prescribed students were more likely to use excuses, alternatives, and internal explanations than direct refusals and external explanations when approached by a friend with ADHD. Direct refusals may be unacceptable in this situation because presumably, knowledge that a friend has ADHD may imply a closer relationship, and thus students might perceive greater potential for relationship harm with direct refusals. Direct refusals also might be less palatable because students with prescriptions may have more empathy for peers with ADHD, given their shared symptomatology. We speculate that prescribed students were less likely to endorse using external explanations because they expect that other prescribed students would find these explanations less credible (e.g., "Sorry, my doctor said if I share my meds he won't prescribe me anymore") based on their own experiences with medication management.

Limitations and Future Directions

The sample was comprised largely of White, non-Hispanic female undergraduates and thus may not generalize to other student populations or non-college attending adults. As males are more likely to engage in NMUPS,²⁹ our results may not be reflective of students most at-risk. Similarly, since more than half of the sample consisted of first-year students, our findings may have limited generalizability to students with more college experience. Our

prior research showed that with each successive year of college, students with prescriptions for stimulant medications were more likely to have been approached for their medication; in fact, by senior year, 91% of students reported that they had been approached for their stimulant medication compared to only 42% of first-years (Names blinded for review, unpublished data, 2017). Other research showed that between the first and last years of college, there was a marked increase in the number of students reporting they had been offered prescription stimulants in their lifetime (36.0% vs. 61.8%, respectively) and an increase in the number of students who used non-medically (13.3% to 31.0%, respectively).³⁰ First-year students in our study likely had less experience with situations similar to the vignettes in our study and therefore, their responses may have reflected a more abstract understanding of the interpersonal dynamics around diversion as opposed to an understanding based on direct experience.

The most notable limitation was the use of hypothetical scenarios that some participants may have found personally irrelevant and/or that may not have included all possible diversion request tactics. The findings may not generalize to actual interpersonal interactions, though our study is an important first step in designing prevention efforts focused on refusal strategies for stimulant diversion. Similarly, we likely did not identify all resistance strategies used by students with prescriptions. Although our measures were adapted from existing instruments, additional research examining the psychometric properties of the resistance strategies measure would be beneficial. Finally, this study was limited to cross-sectional data, which precluded us from inferring causality. We also did not assess for NMUPS prior to college, so some students classified as non-users may have previously engaged in NMUPS.

There are several opportunities for future research, including use of role-plays in laboratory settings, where prescribed students could employ different resistance strategies in response to requests for their medication. Laboratory simulations would be especially helpful in determining whether some resistance strategies are more effective when the student requesting medication continues to apply pressure after an initial refusal and/or the person making the request uses multiple compliance-gaining strategies (e.g., rational-academic, negative feelings). Simulations and qualitative research also might identify resistance strategies not yet reported in the literature. Longitudinal research could establish which resistance strategies are associated with lower diversion risk over time among students with prescriptions and track changes in relationships that occur with use of resistance strategies. This research could inform the development of a preventive intervention that promotes the most effective strategies for resisting requests for their medications, thereby limiting stimulant diversion and NMUPS on college campuses. Prior research evaluating drug and alcohol use prevention programs, such as the “Drug Resistance Strategies Project” (also called keepin’ it REAL), has demonstrated that adolescents’ resistance skills for cigarettes and marijuana could be enhanced via an intervention.³¹ Whether these skills are malleable at a different developmental stage (emerging adulthood) and for a different behavior (stimulant diversion) are open questions, however.

Conclusions

In terms of diversion prevention, psychoeducation promoting use of internal and external explanations is recommended, as students deemed these strategies most effective and palatable interpersonally. The effectiveness of internal explanations, in particular, may be enhanced by adding face support. Further, prescribed students could be encouraged to articulate personally relevant internal and external explanations when approached to divert, since they may be more likely to enact these statements when approached. Although prescribed students were most likely to use excuses when approached by other students with ADHD, our findings from the entire sample suggest that excuses may be the least desirable and effective strategy, indicating that their use should be discouraged.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Means and standard errors for overall perceived strategy effectiveness by strategy type and risk group. Responses could range from 2=least effective at preserving interpersonal harmony *and* discouraging future requests, to 8=most effective at preserving interpersonal harmony *and* discouraging future requests.

Figure 2.

Means and standard errors of composite effectiveness ratings by strategy type with and without the addition of face support. Responses could range from 2=least effective at preserving interpersonal harmony *and* discouraging future requests, to 8=most effective at preserving interpersonal harmony *and* discouraging future requests.

Figure 3.

Means and standard errors for perceived relationship preservation and effectiveness by resistance strategy. Higher scores denote better relationship preservation and more effectiveness at deterring future requests, respectively (responses could range from 1=least effective to preserving harmony *or* least effective at deterring future requests, to 5=most effective at preserving harmony *or* most effective at deterring future requests).

Figure 4.

Means and standard errors for types of resistance strategies preferred by students with stimulant prescriptions ($n=117$). Strategies with different letters are significantly different from one another at $p < .05$ (with Bonferroni correction for multiple comparisons). Response choices ranged from 1=*not at all likely* to 5=*very likely*.

Table 1

Characteristics of Overall Sample and Comparison of Risk Groups on Study Measures

Characteristic	Full sample (N=1507)	Low-risk non- users (LR) (n=880)	At-risk non-users (AR) (n=338)	Non-medical users (NM) (n=289)	Test statistic for group comparisons
Age	19.48 (2.30)	19.43(2.42)	19.41(2.36)	19.76(1.74)	$F_{(2, 1441)} = 2.31$
Gender					
Female	71%	80%	54%	64%	$\chi^2(2)=88.34^{**}$
Male	29%	20%	45%	36%	
Transgender	0.2%	0.1%	0.6%	0%	
Do not identify/prefer to not answer	0.4%	0.4%	0%	0.3%	
Race/ethnicity					
White	57%	53%	59%	66%	$\chi^2(8)=24.08^*$
African American/Black	8%	10%	6%	4%	
Asian/Pacific Islander	4%	4%	5%	3%	
American Indian/Native American	1%	1%	1%	0.30%	
Hispanic/Latino/a	22%	24%	20%	20%	
Bi-/Multiracial, Other	9%	9%	10%	7%	
Class year					
Freshman	51%	54%	59%	35%	$\chi^2(6)=57.60^{**}$
Sophomore	26%	25%	25%	28%	
Junior	13%	13%	8%	21%	
Senior	10%	8%	9%	16%	
University					
Northeast	19%	14%	19%	32%	$\chi^2(4)=50.31^{**}$
Southwest	59%	61%	59%	54%	
Mountain	22%	25%	23%	14%	
Greek membership	13%	8%	18%	24%	$\chi^2(2)=58.76^{**}$
ADHD diagnosis	10%	7%	16%	11%	$\chi^2(2)=25.39^{**}$
Stimulant prescription	8%	4%	15%	9%	$\chi^2(2)=39.31^{**}$
ADHD symptoms M(SD)	2.68(.71)	2.54(.70) _a	2.89(.66) _b	2.88(.69) _b	$F_{(2, 1503)} = 45.51^{**}$

Note. ADHD=Attention deficit hyperactivity disorder. For Chi-square tests, bolded values denote percentages that differed from expected percentages at $p < .05$. For ANOVAs, means in a row with different subscripts were significantly different. All p -values adjusted for multiple comparisons with Bonferroni correction. The chi-square test for race/ethnicity was significant overall, but pairwise comparisons were non-significant with Bonferroni adjustment.

*
 $p < .01$

**
 $p < .001$

Table 2

Intercorrelations among the Resistance Strategies by Stimulant Prescription Status

Variable		<i>M(SD)</i>	1	2	3	4	5
1	Direct refusals	7.30(1.41)	---	.53	.35	.53	.54
2	Suggest an alternative	7.27(1.29)	.83	---	.38	.52	.38
3	Make an excuse	6.79(1.47)	.73	.81	---	.49	.45
4	Internally-motivated explanations	7.52(1.36)	.83	.87	.74	---	.53
5	Externally-motivated explanations	7.53(1.41)	.74	.81	.69	.89	---

Note. Values under the diagonal are for the entire sample; values above the diagonal are for students with prescriptions. Means and standard deviations are for the overall sample. All $ps < .01$