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Author names and affiliations:

Iwona Nowakowska, MA, The Maria Grzegorzewska University, Institute of Psychology,
Szczęśliwicka 40, 02-353 Warsaw, Poland

ORCID: 0000-0001-7701-5612

Corresponding author: Iwona Nowakowska, MA, The Maria Grzegorzewska University,
Institute of Psychology, Szczęśliwicka 40, 02-353 Warsaw, Poland, insd2@aps.edu.pl

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The role of time perspectives and impulsivity dimensions in coping styles

Abstract

Both time perspectives and impulsivity dimensions are groups of traits that are connected to self-control abilities and might be important for coping styles. However, to date, no study has systematically investigated their utility in predicting coping styles with regard to their multidimensional nature. The current study was correlational and exploratory, aiming to discover what amount of variance in each of the three coping styles, problem-oriented, active emotion-oriented, and avoidant, is accounted for by two groups of predictors: time perspectives and impulsivity dimensions. $N = 397$ young adults aged 18-35 from the general population took part in the study. Results of a multiple linear regression testing both groups of predictors separately and of hierarchical regression analysis introducing the two predictor groups in subsequent steps suggested that time perspectives accounted for more variance in adaptive coping styles: problem-oriented and active emotion-oriented coping. For avoidant coping, both time perspectives and impulsivity dimensions accounted for a similar amount of variance. The results provide evidence that time perspectives should be investigated in domains related to coping (e.g., mental health issues, substance abuse, risk-taking behaviors), for which impulsivity has been considered an important predictor. Moreover, impulsivity ought to be tested with regard to its multidimensionality.

Key words

coping, impulsivity, self-regulation, time perspectives, young adults

Introduction

Coping with stress is a form of self-regulation of emotion and behaviors and is defined as a set of affective, cognitive, and behavioral intrapsychic efforts and responses to the challenges that are faced by the individual (Lazarus and Folkman, 1984). Coping with stress is important to alleviate negative emotional states which occur, to prevent further adverse consequences of distress. Experiencing emotional distress and negative emotional arousal can result in a preference for immediate over long-term rewards (Lin & Epstein, 2014; Malesza, 2019), which is an example of delay discounting.

Delay discounting is defined as the devaluation of future outcomes over immediate rewards (Green & Myerson, 2004). Individuals with a tendency for delay discounting choose a more quickly achievable, but smaller reward rather than a bigger reward for which they would need to wait. Such choices are considered impulsive, given that being able to wait would result in a more attractive reward (Teuscher & Mitchell, 2011). Delay discounting is thus theoretically linked to self-control abilities (Bickel & Marsch, 2001). Self-control is the capability to refrain from impulsive reactions and/or behaviors that can be counterproductive in attaining goals (Vohs and Baumeister, 2016). Coping might be dependent on self-regulation mechanisms, including self-control resources (Ochsner and Gross, 2008). High self-control and orientation towards the future might be associated with a proactive attitude toward attaining everyday life goals (Gellert et al., 2012). On the contrary, low self-control and orientation toward the present may be related to higher distress, substance use, and risky behaviors (Daugherty and Brase, 2010; Dwivedi and Rastogi, 2017). Interestingly, negative emotional arousal may result in a greater tendency for delay discounting, given that the immediate rewards can bring immediate relief from the experienced stress (Lempert et al., 2012; Malesza, 2019).

Thus, it can be assumed that two groups of variables might be especially relevant for self-control processes, including coping styles: time perspectives (TPs) (Baird et al., 2020; Mucha et al., 2020) and impulsivity dimensions (IDs) (Li et al., 2019; Nigg, 2017). TPs enable to assess to what degree a person is oriented to particular timeframes (e.g. to the past, present, or future; Zimbardo & Boyd, 2008), and for instance, considers prospective behaviors in light of own predominant time perspective. IDs describe the tendency to act with limited consideration or evaluation of future consequences (Gerbing et al., 1987), which is conceptually overlapping to some degree with the future and present TPs (Zimbardo and Boyd, 1999). Although also sharing the pattern of activation of the core control network (Wittmann et al., 2011), TPs and IDs are not redundant to each other and may have specific consequences for human coping and behavior (see Jochemczyk et al., 2017; Lennings, 1991). Their unique value in predicting coping styles has not been investigated systematically to date.

Given that both TPs and IDs are multidimensional constructs, the study aims to explore which particular TPs and IDs might predict each of the three basic coping styles: (1) problem-oriented; (2) active emotion-oriented; (3) avoidant. The unique contribution of both predictor groups (TPs and IDs) will be presented, as well as the assessment of which of the types of TPs and IDs remain significant predictors of each of the coping styles when taken all together.

Coping styles

According to the stress-coping model, the adopted strategies to reduce stress reflect appraisal of the threat that the stressor poses (Lazarus and Folkman, 1984). Coping can be classified as problem-oriented or emotion-oriented (Carver and Scheier, 1994). Problem-focused coping is typically considered adaptive, aimed at tackling the source of distress, whereas emotion-oriented coping aims to regulate own emotions (Folkman and Lazarus, 1985; Holahan and

Moos, 1987). Emotion-oriented coping can be further differentiated into active and avoidant (Holahan and Moos, 1987). Active emotion-oriented coping is considered adaptive, aiming to vent or reframe the impact of a stressor (Folkman and Lazarus, 1985). Avoidant coping is deemed maladaptive, connected to disengagement from tackling the source of stress (Holahan and Moos, 1987), and is connected to worse health (Coyne and Racioppo, 2000). Importantly, coping styles should be viewed as different, but not opposite to each other (Compas et al., 2001).

Time perspectives and coping styles

TP is a process of assignment of the continual flow of experiences to time frames to give sense and coherence to events in life (Zimbardo and Boyd, 1999). It is generally considered stable and formed through cultural and learning processes (Jochemczyk et al., 2017). The most popular classification of TPs by Zimbardo and Boyd (1999) distinguishes five types: past negative (PNTP), past positive (PPTP), present hedonistic (PHTP), present fatalistic (PFTP), and future (FTP). PNTP is connected to thinking about bad events from the past, and preoccupation with feelings of guilt and regret. PPTP is linked to a happy, joyful view of one's past. PHTP is related to carefree and impulsive acts, as well as seeking pleasure and risks. PFTP is associated with a focus on the present but is linked with thinking about oneself as helpless and powerless. Finally, FTP implies a tendency to plan, consider future consequences of own actions, and conscientious fulfillment of obligations.

Individual differences in TPs can be also directly linked to coping styles (Anagnostopoulos and Griva, 2012; Bolotova and Hachaturova, 2012, 2013; Zambianchi and Ricci Bitti, 2014). The hypothesized reason for this is the fact that time perspectives might affect primary and secondary appraisals (Anagnostopoulos and Griva, 2012). For instance, FTP can be associated with adaptive, engaged, and flexible coping (Bolotova and Hachaturova, 2012; Iwanicka et

al., 2017; Zambianchi, 2018). PHTP – to avoidant coping (Zambianchi, 2018). Interestingly, during a conflict situation, past and future-oriented persons were found to have a more cooperative attitude than the present-oriented people (Boniwell and Zimbardo, 2004), which suggests that these time orientations can promote proactive strategies of dealing with problems. High scores on present-orientation can however also relate to maladaptive ways of coping, e.g., helplessness, avoidance, or to feelings of anger (Wills et al., 2001). At the same time, PNTP can correlate with disengagement and maladaptive styles (Bolotova and Hachaturova, 2012). According to Holman (2015), early social processes (specifically, social relationships quality) following traumatizing events can predict the later development of past negative or future orientation after these events, and as a consequence, influence the levels of psychological distress. At the same time, Blomgren and colleagues (2016) have found for late adolescents that adaptive coping is predicted by both FTP (a future positive subdimension) and PHTP, whereas maladaptive coping – by FTP (future negative subdimension), PHTP, and negatively by FTP (future positive subdimension). This suggests that the PHTP may have two facets: a positive, supporting beneficial outcomes, and a negative one, supporting detrimental ways of coping. Drawing on the data provided by Zimbardo and Boyd (1999; 2008), it might be hypothesized that PHTP may promote both seeking pleasure and sensation, which supports well-being, as well as PHTP, may predict taking unnecessary risks or engaging in distracting activities, characteristic for avoidant approaches to solving problems.

PPTP and coping styles have been evidenced to show no significant correlations with coping styles (Blomgren et al., 2016), however, have been proven to correlate significantly with coping strategies such as lower awareness of own importance, lower distraction, higher optimism, emotional relief, cooperation, and altruism (Bolotova and Hachaturova, 2013). Iwanicka and colleagues (2017) found out among people addicted to alcohol that people who are coping by avoidance displayed higher levels of past than present- or future-orientation.

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People who were oriented at task solving (problem-oriented coping), displayed higher levels of FTP. These patterns may be understood in the light of the Zimbardo and Boyd (2008) arguments that FTP promotes concentration on goal achievement and challenges, whereas dwelling on the past (especially the negative past) may lead to focus on losses and result in depressive or anxiety symptoms.

As indicated above, the TPs have been shown to predict various coping styles. However, the available studies do not take them into account together with theoretically overlapping (especially in terms of FTP and PHTP), and non-redundant constructs such as the IDs.

Impulsivity dimensions and coping styles

Impulsivity is the predisposition to unplanned actions to internal and external stimuli without considering the negative consequences of these actions for an individual and the environment (Poprawa, 2019).

Whiteside and Lynam (2001) and later Cyders and Smith (2008) found that impulsivity might consist of five dimensions: (1) lack of premeditation – difficulties in overthinking consequences of an action before undertaking it; (2) sensation seeking- a tendency to undertake and derive pleasure from exciting and/or risky activities and openness to experiences, even if they are dangerous; (3) lack of perseverance – deficit in concentration on tasks when they become boring or difficult; (4) negative urgency – a tendency to engage in impulsive behavior when experiencing negative emotions; and (5) positive urgency – a tendency to engage in such behavior when experiencing positive emotions. These dimensions are proven to exist regardless of gender, age, ethnicity, or nationality (Poprawa, 2019).

Heightened impulsivity might be linked to poor self-control, especially in the domain of response inhibition (Steinberg et al., 2008). The differential choice model suggests that trait self-control is associated with more reflective coping rather than involuntary or automatic

ways of responding (Galla and Wood, 2015). Fowler and colleagues (2020) argue that low self-control might be linked to automatic, rather than reflective coping strategies, which are presumably emotion-focused, avoidant, and potentially maladaptive. The available studies are often focused on the effects of impulsivity and coping strategies/styles on behavioral addictions or maladaptive substance use, sometimes understanding engagement in these problematic behaviors as an emotion-focused or avoidant strategy of self-regulation (e.g., Li et al., 2019; Nower et al., 2004). However, one of the IDs, sensation seeking, was also found to act as a stress-buffering resource rather than a risk factor for detrimental coping (McKay et al., 2018; Solomon et al., 1995). Although this ID displays in for instance risk-taking, which is viewed as negative or even irrational (Lupton and Tulloch, 2002), it was shown to relate to resilience, and this relationship was partially mediated by problem-focused coping (McKay et al., 2018). This bears resemblance to PHTP, as elaborated above – on the one hand, sensation seeking may promote negative, risky behaviors, but on the other, may be linked to seeking proactive ways to deal with adverse situations.

The majority of studies examining impulsivity and coping on various populations focus on impulsivity in general, in some cases distinguishing it from sensation seeking. However, given the wider spectrum of IDs and the distinct features each ID has, it is worth exploring more systematically how each of the IDs can be linked to each of the coping styles, and how.

The current study

The aim of the study is to explore which TPs and IDs might predict coping styles: (1) problem-oriented; (2) active emotion-oriented; (3) avoidant. Based on the abovementioned literature review, it is suggested that testing within a single research plan the contributions of TPs and IDs in predicting clearly defined coping styles is worthwhile. The study goal is to answer this research gap and advance the current literature, given that to date no such study

has been conducted. The results can help understand, whether and which TPs and IDs predict coping styles, and which group of predictors – TPs (describing how one refers to timeframes and use them to guide behavior) or IDs (describing behavioral tendencies) better explains how people deal with stress. Moreover, taking into account a variety of subdimensions of TPs and IDs, the study will enable us to distinguish the particular facets that contribute to ways of coping. Such an analysis, apart from advancing knowledge regarding coping determinants, might be valuable for practitioners who work with their clients on maladaptive coping styles, TPs, or impulsive behaviors and their consequences. Knowing which trait or group of traits to address, and what the result of such work might be is important for planning and maximizing the effectiveness of the therapeutic programs.

The study is correlational and exploratory in its nature. The research questions posed are:

(Q1): What amount of variance in each of the coping styles (problem-oriented, active emotion-oriented, avoidant) is accounted for by (a) TPs and (b) IDs? (Q2) What amount of variance is added by these two groups of predictors: TPs and IDs, when they are entered together into a hierarchical model?; (Q3) Which particular TPs and IDs predict each of the coping styles?

Method

Note on data

This study was part of a larger project. Analyses testing unrelated hypotheses will be reported elsewhere. The study materials, dataset, and syntax filtering outliers for this study as well as the most recent bibliographic data for publications based on this data can be found at <https://osf.io/fp6n2/>.

Procedure

The study was questionnaire-based and anonymous, conducted online. The recruitment of the participants took place on social media; the study was announced as a study of how young adults perceive themselves, make decisions and participate in volunteerism. All people willing to participate who were aged 18-35 were invited. Announcements contained a link to LimeSurvey where the set was available. The first screen of the survey set presented details about the study which were necessary to provide informed consent. Participation was not remunerated.

In three random places in the survey, questions checking attention were posed, stating: “This question controls your attention. Tick <a defined option 1, 2, 3>.

Preliminary analyses

A total of 442 people filled out the set. Prior to the analysis, participants who did not fit the inclusion criteria (being of age 18-35 and answering any of the attention check questions incorrectly) were excluded. This resulted in 402 participants left for further analyses. Then, the variables of interest of this study were standardized to perform an outlier analysis. Participants who scored less than -3 or over 3 on any of the standardized variables of interest for this study were not taken into account for this analysis. This resulted in a final sample of 397 participants.

A post-hoc power analysis using G*Power 3.1 (Faul et al., 2009) suggested that this sample size made it possible to detect an effect of partial R^2 increase of .05 ($\alpha = .05$) with a power of .96 for models with four predictors (TPs), .95 for five predictors (impulsivity dimensions) and .89 for models taking into account both examined variable groups.

Participants and procedure

303 participants were female (76.3%) and 94 male (23.7%), aged 18-35 ($M = 23.24$, $SD = 3.67$).

75 participants (18.9%) were inhabitants of a village, 87 (21.9%) of a town with less than 100,000 inhabitants, 70 (17.6%) of a town with 100,001-499,999 inhabitants, and 165 (41.6%) of a town with over 500,000 inhabitants.

3 people had a primary school education (0.8%), 2 vocational school (0.5%), 2 high school (0.5%), 216 were pursuing a Bachelor's degree or equivalent (54.4%), 117 – were pursuing a Master's or equivalent (29.5%), 54 – were pursuing a PhD (13.6%), and 3 declared other education status (0.8%).

3 people were school students (0.8%), 177 were higher education (HE) students and did not work (44.6%), 99 were HE students and also worked (24.9%), 22 mainly worked and were full-time HE students (5.5%), 43 mainly worked and were part-time HE students (10.8%), 50 worked (12.6%), 1 did not work or study (0.3%), and 2 people declared other employment situation (0.5%).

Measures

Coping. Coping was measured with Brief COPE (Carver, 1997; Polish adaptation: Juczyński and Ogińska-Bulik, 2009). The scale has a self-report character and consists of 28 items that form 14 subscales (coping strategies). For the sake of the current study, the 14 strategies were further aggregated into three coping styles according to a suggestion by Schnider and colleagues (2007): problem-oriented, active emotion-oriented, and avoidant. The problem-oriented coping style consisted of strategies: religion, instrumental support, planning, and active coping; the active emotion-oriented coping of strategies: emotional support,

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acceptance, humor, positive reframing, venting; and the avoidant coping of strategies: substance use, self-blame, behavioral disengagement, denial, self-distraction. The participants answered on a scale ranging from 1 – *I haven't done this at all* to 4 – *I have done this a lot*. The total levels of three coping styles were computed as the mean of the items that form the abovementioned Brief COPE subscales.

Time perspectives. TPs were assessed with the Polish short version of ZTPI (Zimbardo and Boyd, 1999; Polish version: Przepiorka et al., 2016). The scale is a self-report questionnaire consisting of 20 items forming 4 subscales with 5 items each: past positive; past negative; present hedonistic and future. Participants marked their answers on a scale ranging from 1 – totally disagree to 5 – totally agree. Some items are reverse-coded. The results were computed as mean scores from items that form the subscales according to the key.

Impulsivity dimensions. Impulsivity dimensions were measured with SUPPS-P (Cyders et al., 2014; Polish adaptation: Poprawa, 2019). The scale is a self-report questionnaire and consists of 20 items forming 5 subscales with 4 items each: negative urgency, lack of premeditation, lack of perseverance, sensation seeking, positive urgency. The participants marked their answers on a scale ranging from 1 (totally disagree) to 4 (totally agree). Some items are reverse-coded. The results were computed as mean scores from items forming the subscales according to the key.

Ethics

The study materials and protocol were approved by the research ethics board at <blinded for peer review>. The study conformed to the 1964 Declaration of Helsinki with later amendments.

Results

Below the results of the analyses conducted are presented. First, a correlation analysis was run to explore relationships between the variables. The main analysis of interest was conducted using linear regression analyses. Three dependent variables were taken into account: problem-oriented coping, active emotion-oriented coping, and avoidant coping. For each of them, two models were run: the first one with TPs as predictors, and the second with IDs as predictors. These models enable us to find out which of the TPs/IDs predict each of the coping styles when TPs and IDs are taken into account separately. Furthermore, hierarchical models with TPs and IDs taken together were run to assess whether TPs or IDs account for more variance percentage when taken together, as well as which dimensions of both constructs remain significant. In the current study, $p < .05$ is considered significant. Unless otherwise stated, statistics are provided for standardized variables.

Table 1 presents correlations and descriptive statistics of all variables. Problem-oriented coping was positively associated with FTP and PPTP, as well as negatively with PNTP. It was also negatively related to negative urgency, lack of premeditation, and lack of perseverance.

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Table 1 *Correlations between coping styles, time perspectives, and impulsivity dimensions*

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Problem-oriented coping	-											
2. Active emotion-oriented coping	.53***	-										
3. Avoidant coping	-.29***	-.15**	-									
4. Future TP	.30***	.08	-	-								
5. Past positive TP	.42***	.38***	.25***	.14**	-							
6. Past negative TP	-.26***	-.21***	.21***	-.10*	-	-						
7. Present hedonistic TP	-.04	.19***	.44***	-	.27***	.06	.10*	-				
8. Negative urgency	-.11*	.05	.18***	.23***	-	.12*	.54***	.40***	-			
9. Lack of premeditation	-.32***	-.09	.44***	.25***	-.13*	.12*	.54***	.40***	-			
10. Lack of perseverance	-.25***	-.08	.31***	.46***	-.15**	.06	.08	.17***	.37***	-		
11. Sensation seeking	.07	.16**	.26***	.69***	-.10	-.07	.49***	.05	.23***	.00	-	
12. Positive urgency	-.07	.13*	.32***	-.30***	-.06	.22***	.37***	.53***	.36***	.22***	.15**	-
Cronbach's α	.73	.64	.72	.79	.78	.82	.76	.82	.85	.84	.79	.87

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<i>M (SD)</i>	2.69(.49)	2.64(.42)	2.19 (.44)	3.60 (.84)	3.51 (.86)	3.47 (.98)	2.81 (.83)	2.48 (.74)	1.87 (.58)	1.88 (.61)	2.55 (.73)	2.09 (.76)
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Note. * - $p < .05$; ** - $p < .01$; *** - $p < .001$. Descriptive statistics are provided for non-standardized variables.

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Active emotion-oriented coping was positively associated with PPTP and PHTP, as well as negatively with PNTTP. It was also positively related to sensation seeking and positive urgency.

Avoidant coping was positively associated with PN and hedonistic TPs, as well as negatively with FTP and PPTP. It was also positively related to negative urgency, lack of premeditation, lack of perseverance, and positive urgency.

Tables 2-4 present the results of multiple linear regression analysis, each table for one of the three dependent variables - coping styles – problem-oriented coping (Table 2), active emotion-oriented coping (Table 3), and avoidant coping (Table 4). All tables present results for two groups of predictors: TPs (Models “a”) and IDs (Models “b”). Tables presenting the results of hierarchical regressions (Tables S1-S3) are available in the Supplementary Material.

Table 2 *Multiple linear regression analysis with time perspectives and impulsivity dimensions as predictors of problem-oriented coping*

Predictors	β	VIF	p
Model 1a: Time perspectives as predictors of problem-oriented coping			
Future TP	.24	1.08	.000
Past positive TP	.35	1.11	.000
Past negative TP	-.14	1.10	.002
Present hedonistic TP	.01	1.08	.842
F(4, 392) = 33.09; $p < .001$			
$R_{adj}^2 = .245$			
Model 2a: Impulsivity dimensions as predictors of problem-oriented coping			
Negative urgency	.01	1.50	.858
Lack of premeditation	-.33	1.45	.000
Lack of perseverance	-.14	1.18	.005
Sensation seeking	.14	1.09	.006
Positive urgency	.05	1.47	.337
F(5, 391) = 13.26; $p < .001$			
$R_{adj}^2 = .134$			

In Model 1a, FTP and PPTP were significant predictors of problem-oriented coping, whereas PN TP was a significant negative predictor of problem-oriented coping. Out of the TPs, PPTP

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was the most prominent predictor of problem-oriented coping ($\beta = .35$). In Model 2a, sensation seeking was predictive of problem-oriented coping. Lack of premeditation and lack of perseverance were negative predictors of problem-oriented coping. Out of IDs, lack of premeditation was the most prominent predictor of problem-oriented coping ($\beta = -.33$). When taken in separate models, TPs accounted for more variance in problem-oriented coping (24.5%) than IDs (13.4%).

When taken in a hierarchical model, FTP ($\beta = .16$), PPTP ($\beta = .32$) and PNTP ($\beta = -.17$) TPs, as well as lack of premeditation ($\beta = -.30$) remained significant predictors of problem-oriented coping. The whole model accounted for 29.2% of the variance in problem-oriented coping. IDs accounted for an additional 4.7% of the variance when introduced in the second step of hierarchical regression, whereas TPs – for an additional 15.8% of the variance when introduced in the second step. Details of the model are presented in Table S1.

Table 3 *Multiple linear regression analysis with time perspectives and impulsivity dimensions as predictors of active emotion-oriented coping*

Predictors	β	VIF	p
Model 1b: Time perspectives as predictors of active emotion-oriented coping			
Future TP	.07	1.08	.146
Past positive TP	.32	1.11	.000
Past negative TP	-.14	1.10	.003
Present hedonistic TP	.20	1.08	.000
F(4, 392) = 24.18; $p < .001$			
$R_{adj}^2 = .190$			
Model 2b: Impulsivity dimensions as predictors of active emotion-oriented coping			
Negative urgency	.04	1.50	.557
Lack of premeditation	-.18	1.45	.003
Lack of perseverance	-.06	1.18	.272
Sensation seeking	.18	1.09	.001
Positive urgency	.16	1.47	.008
F(5, 391) = 5.96; $p < .001$			
$R_{adj}^2 = .059$			

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In Model 1b, PPTP and PHTP were significant predictors of active emotion-oriented coping, whereas PNTP was a negative predictor of this coping style. Out of the TPs, PPTP was the most prominent predictor of active emotion-oriented coping ($\beta = .32$). In Model 2b, sensation seeking and positive urgency were positive predictors of active emotion-oriented coping, whereas lack of premeditation was a negative predictor of this coping style. All of the significant predictors of the IDs were of similar importance ($\beta = -.18$ for lack of premeditation, $\beta = .18$ for sensation seeking, $\beta = .16$ for positive urgency). TPs accounted for more variance (19.0%) than IDs (5.9%) in predicting active emotion-oriented coping. When taken in a hierarchical model, PPTP ($\beta = .31$), PNTP ($\beta = -.18$), and PHTP ($\beta = .21$) as well as lack of premeditation ($\beta = -.22$) and positive urgency ($\beta = .15$) remained significant predictors of active emotion-oriented coping. The whole model accounted for 22.9% of the variance in active emotion-oriented coping. IDs accounted for an additional 3.9% of the variance when introduced in the second step of hierarchical regression, whereas TPs – for 17.0% of the variance when introduced in the second step. Details of the model are presented in Table S2.

Table 4 *Multiple linear regression analysis with time perspectives and impulsivity dimensions as predictors of avoidant coping*

Predictors	β	VIF	p
Model 1c: Time perspectives as predictors of avoidant coping			
Future TP	-.17	1.08	.000
Past positive TP	-.08	1.11	.071
Past negative TP	.39	1.10	.000
Present hedonistic TP	.11	1.08	.019
F(4, 392) = 33.12; $p < .001$			
$R_{adj}^2 = .245$			
Model 2c: Impulsivity dimensions as predictors of avoidant coping			
Negative urgency	.34	1.50	.000
Lack of premeditation	.09	1.45	.111
Lack of perseverance	.16	1.18	.001
Sensation seeking	.01	1.09	.855
Positive urgency	.08	1.47	.160

$$F(5, 391) = 25.05; p < .001$$

$$R_{adj}^2 = .233$$

In model 1c, PNTP and PHTP were predictors of avoidant coping. FTP was also a negative predictor of avoidant coping. Out of the TPs, PNTP was the most prominent predictor of avoidant coping ($\beta = .39$).

In Model 2c, negative urgency and lack of perseverance were predictors of avoidant coping. Out of all the IDs, negative urgency ($\beta = .34$) was the most prominent predictor of avoidant coping.

Both TPs and IDs accounted for a similar amount of variance in avoidant coping (24.5% and 23.3%, respectively).

When taken in a hierarchical model, PN ($\beta = .33$) TP, negative urgency ($\beta = .26$), lack of premeditation ($\beta = .12$) and lack of perseverance ($\beta = .17$) remained significant predictors of avoidant coping. The whole model accounted for 33.5% of the variance in avoidant coping. IDs accounted for an additional 9.0% of the variance when introduced in the second step of hierarchical regression, whereas TPs – for an additional 10.2% of the variance when introduced in the second step. Details of the model are presented in Table S3.

Discussion

The main aim of the study was to explore which TPs and IDs might predict each of the three coping styles: (1) problem-oriented; (2) active emotion-oriented; (3) avoidant. The results will be discussed with reference to TPs in the first part and IDs in the second.

Time perspectives and coping styles

FTP was a positive predictor of problem-oriented and active emotion-oriented coping, whereas it was a negative predictor of avoidant coping. The result is consistent with the

notion that FTP is a promoter of activities aimed at planning, as well as constructively dealing with the demands of the environment (Zimbardo and Boyd, 1999). Previous research suggested that it also facilitates creative problem solving (Zambianchi, 2018) and choices of proactive coping strategies in interpersonal conflicts (Bolotova and Hachaturova, 2013). Past-negative TP was a negative predictor of problem-oriented and active emotion-oriented coping, as well as a positive predictor of avoidant coping. Out of the TPs, it was the most prominent predictor of avoidant coping. PNTP is connected to a negative, discouraged view of the past (Anagnostopoulos and Griva, 2012; Zimbardo and Boyd, 1999). This result suggests that past experiences might be important for coping styles in the present, and, as a consequence, result in a maladaptive style of avoiding tackling the source of the problem or actively dealing with own emotions. This is in line with the findings by Iwanicka and colleagues (2017) from a study conducted on people with alcohol use dependency, which suggested that usage of avoidant coping was associated with the negative past orientation rather than orientation to the present or future. The result is also congruent with the notion that dwelling on the past can result in a lower capacity to deal effectively with stressors (Zimbardo and Boyd, 2008). At the same time, in the current study, PPTP was a positive predictor of problem-oriented and active emotion-oriented coping, and the most prominent predictor of both of these coping forms out of the TPs. In contrast to PNTP, a positive outlook on the past can promote actively dealing with stressors. The associations of PPTP with coping styles were not found in a study by Blomgren and colleagues (2016), however, this may be due to the different age group taken into account – in a study by Blomgren and colleagues, late adolescents were of interest, whereas in the current study, young adults were taken into account. Possibly PPTP can bring more value in the lives of young adults, who may treat their positive past as a resource to build upon and to find their ways of navigating their life.

PHTP was a positive predictor of active emotion-oriented coping, as well as of avoidant coping. Presumably, hedonism, as it is connected to spontaneity and seeking risks and thrills (Jochemczyk et al., 2017; Zimbardo and Boyd, 1999), might be a promoter of emotion-oriented styles of coping – both by addressing or avoiding emotions, instead of tackling the problem. This is in line with the hypothesized difference between FTP and PHTP. FTP promotes planning and acting for long-term success, whereas PHTP – acting with little regard for the FTP consequences of actions (Zimbardo and Boyd, 1999). Engagement in risky actions, characteristic for PHTP (Zimbardo and Boyd, 2008), might be a form of escaping from the negative emotions – and this may underlie the observed positive relationship between PHTP and avoidant coping.

Impulsivity dimensions and coping styles

The study was pioneering in terms of assessing the contribution of self-reported impulsivity treated multidimensionally to coping styles. Thus, the results can be discussed mainly concerning the theoretical aspects of ID characteristics.

Negative urgency was a positive predictor of avoidant coping, as well as its most prominent predictor out of the IDs. Positive urgency was a positive predictor of active emotion-oriented coping. It needs to be noted that both forms of urgency mean the tendency to react impulsively under affect which is difficult to cope with for a person (Cyders and Smith, 2008). The result from the current study is therefore in line with this definition, suggesting that both dimensions of urgency are related to coping styles oriented at emotions, whereas negative urgency – to a maladaptive style and positive – to an adaptive style. Both types of urgency were related to emotion-oriented forms of coping, which is in line with the idea of urgency as "emotion-related impulsivity" (Carver and Johnson, 2018). In the literature, general urgency was found to correlate to maladaptive forms of emotion-oriented coping such

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as binge eating (Fischer et al., 2004). In another study, negative urgency correlated negatively with proactive and preventive coping (Altan-Atalay and Zeytun, 2020), however, such a result was not confirmed in the current study.

Lack of premeditation was a negative predictor of problem-oriented and active emotion-oriented coping, as well as the most prominent predictor of problem-oriented coping out of the IDs. Lack of premeditation is connected to deficits in planning and considering FTP consequences (Whiteside and Lynam, 2001), therefore, the pattern of its associations to proactive coping, which requires designing solutions and successful management of emotions, can be observed.

Lack of perseverance was a negative predictor of problem-oriented coping and a positive predictor of avoidant coping. Presumably, tackling the source of the problem requires persistence in realizing a relevant strategy. Out of the investigated coping styles, avoidant coping is connected the most to disengagement and involves the smallest amount of resources – thus, it might be considered the easiest to implement. People having trouble in perseverance in their actions might be therefore inclined to choose coping styles which do not require much engagement of personal resources nor follows a strict plan.

Sensation seeking was a positive predictor of problem-oriented and active emotion-oriented coping. It has been argued in the literature that sensation seeking is different from impulsivity (lack of self-control, response inhibition deficiency) and is defined as seeking stimulating, novel experiences and readiness to take risks to do so (Steinberg et al., 2008). It shows different patterns of association to behavioral outcomes, e.g., alcohol use (Magid et al., 2007) than impulsivity. In the light of the current research, presumably, it promotes active forms of coping through trying solutions and seeking novel ways to do so. Interestingly, the linkages of sensation seeking to coping styles were not the same as for PHTP and coping, although sensation seeking and PHTP are conceptually related (Zimbardo and Boyd, 1999). This

provides an insight into the fact that TPs and IDs, although may capture similar tendencies, are not redundant.

Hierarchical models

TPs taken as a group of predictors accounted for more variance in problem-oriented, as well as in active emotion-oriented coping than IDs. Both IDs and TPs accounted for a similar amount of variance in avoidant coping. To date, much research has considered impulsivity as a contributor to the development of maladaptive forms of dealing with stress (Moustafa et al., 2017) and a factor that can lead to clinical problems (Bayard et al., 2011). TPs however can also contribute to psychological outcomes which might rely on stress coping strategies (Anagnostopoulos and Griva, 2012; Bodecka et al., 2021; Zimbardo and Boyd, 1999). Based on the data from the current study, it can be hypothesized that TPs are worth exploring further in the contexts of coping styles and of their consequences, also in behavioral and psychological domains in which IDs have been considered prominent predictors.

Implications of the study

Coping with stress is a competence important to maintain health and deal with the demands of the environment. The results from the current study have several implications for psychological practice. First, they suggest that introducing the subject of TPs when working on coping styles with clients could be helpful to facilitate learning proactive attitudes towards stressors. Second, they indicate the value of particular TPs and IDs in building personal resources. Although some impulsivity facets are referred to as irrational (as it is for sensation seeking, Lupton and Tulloch, 2002), still, people who are characterized by high levels of IDs can also utilize these features as beneficial to cope with stressors using proactive (problem-

oriented or active-emotion oriented) styles. Thus, psychologists can work with the clients focusing on building upon these personal resources to learn new behaviors.

Limitations and future research directions

The work has several limitations which need to be taken into account when interpreting the results. Firstly, by design, the study was self-report-based, cross-sectional, and purely correlational, making it impossible to form causality statements. Moreover, the Brief COPE subscales were aggregated arbitrarily according to a suggestion by Schnider and colleagues (2007), which is based on a literature review. Furthermore, the Polish short form of the Zimbardo Time Perspective Inventory was also employed to assess time perspectives; this measure does not include the PFTP subscale, which prevented testing the link of this variable to coping styles. Impulsivity was also measured with a questionnaire and is therefore considered a trait, not behavioral reactivity. Moreover, the sample consisted of mainly female, Caucasian participants from a developed country, so the results need to be interpreted with caution with regard to this limitation. Finally, by design, the study involved only young adults as participants, which makes the models valid only for this age group.

Future studies can broaden the understanding of the role of TPs and impulsivity in coping styles by (a) employing longitudinal designs to test the hypotheses; (2) using ecologically valid measures, e.g., diary method to assess coping, behavioral tasks to assess impulsivity, etc.; (3) testing the linkages between constructs in other populations and various age groups.

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Supplementary Material
for *The role of time perspectives and impulsivity dimensions in coping styles:*
An exploratory study on young adults

Details on hierarchical models

Predicting problem-oriented coping

Table S1 *Multiple linear regression analysis predicting problem-oriented coping with TPs and impulsivity dimensions*

Predictors	β	VIF	p	R_{adj}^2
Future TP	.16	2.14	.012	.292
Past positive TP	.32	1.14	.000	
Past negative TP	-.17	1.21	.000	
Present hedonistic TP	.07	1.97	.234	
Negative urgency	.08	1.66	.162	
Lack of premeditation	-.30	1.81	.000	
Lack of perseverance	-.01	1.99	.879	
Sensation seeking	.06	1.37	.237	
Positive urgency	.07	1.51	.192	
F(9, 387) = 19.18; $p < .001$				
Impulsivity dimensions introduced in II step: $\Delta R_{adj}^2 = .047$				
TPs introduced in II step: $\Delta R_{adj}^2 = .158$				

Predicting active emotion-oriented coping

Table S2 *Multiple linear regression analysis predicting active emotion-oriented coping with TPs and impulsivity dimensions*

Predictors	β	VIF	p	R_{adj}^2
Future TP	.06	2.14	.361	.229
Past positive TP	.31	1.14	.000	
Past negative TP	-.18	1.21	.000	
Present hedonistic TP	.21	1.97	.001	
Negative urgency	.07	1.66	.194	
Lack of premeditation	-.22	1.81	.000	
Lack of perseverance	.03	1.99	.596	
Sensation seeking	.05	1.37	.385	
Positive urgency	.15	1.51	.006	
F(9, 387) = 14.08; $p < .001$				
Impulsivity dimensions introduced in II step: $\Delta R_{adj}^2 = .039$				
TPs introduced in II step: $\Delta R_{adj}^2 = .170$				

Predicting avoidant copingTable S3 *Multiple linear regression analysis predicting avoidant coping with TPs and impulsivity dimensions*

Predictors	β	VIF	p	R_{adj}^2
Future TP	.03	2.14	.585	.335
Past positive TP	-.05	1.14	.224	
Past negative TP	.33	1.21	.000	
Present hedonistic TP	-.08	1.97	.192	
Negative urgency	.26	1.66	.000	
Lack of premeditation	.12	1.81	.036	
Lack of perseverance	.17	1.99	.005	
Sensation seeking	.07	1.37	.122	
Positive urgency	.06	1.51	.232	
F(9, 387) = 23.15; $p < .001$				
Impulsivity dimensions introduced in II step: $\Delta R_{adj}^2 = .090$				
TPs introduced in II step: $\Delta R_{adj}^2 = .102$				