



# A Meta-Analysis on the Connection Between Threat Origin and Need Dissatisfaction

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**Abstract**

Considering the large amount of literature on distinct threats, Reiss et al. (2021) suggested an extensive threat categorization system, e.g., according to phenomenological origin (threat: social or personal). The current project investigates this threat distinction, two of their related hypotheses (moderation hypotheses) and one underlying claim (main hypothesis). For this, the method of choice was a meta-analysis (116 correlations from 103 studies). However, this approach requires more explicit definitions than given by Reiss et al. (2021). Thus, we interpreted their threat distinction (origin: social or personal) based on the construal-level theory (Trope & Liberman, 2010) and the social identity theory (Hogg, 2016). The resulting findings were in line with (1) our main hypothesis, indicating a correlation between psychological threats and basic need dissatisfaction in general ( $r = 0.49$ ,  $p < .0001$ , 95% CI [0.43, 0.55]), (2) with our first moderation hypothesis, suggesting a stronger correlation between personal threats and autonomy need dissatisfaction ( $r = 0.38$  [0.29, 0.47]) than between personal threats and other need dissatisfaction ( $r = 0.22$  [0.16, 0.29]) (3) and, with our second moderation hypothesis, indicating a stronger correlation between social threats and belongingness need dissatisfaction ( $r = 0.65$  [0.58, 0.71]) than between social threats and other need dissatisfaction ( $r = 0.44$  [0.33, 0.54]). Primary limitations was the inevitable deviation from Reiss et al.'s (2021) original threat categories and the restricted scope of the project. Altogether, these findings point to the applicability of Reiss et al.'s (2021) threat distinction and related assumptions. Further investigation recommended.

*Keywords:* personal threat, social threat, basic needs, construal-level theory

### **A Meta-Analysis on the Connection Between Threat Origin and Need Dissatisfaction**

Feeling excluded by others, facing financial difficulties or failing at a task – these are only some of the countless situations that may threaten us at a psychological level (Dupuis & Newby-Clark, 2016; Gerber & Wheeler, 2009; Wakeman et al., 2019; Xu & McGregor, 2018). The reason for this is that they menace those goals which matter for the fulfillment of our basic needs, i.e., human desires which go beyond material necessities like food and shelter (P. Leander & Chartrand, 2017; Radel et al., 2013; Reiss et al., 2021; Xu & McGregor, 2018). Reactions to such psychological threats vary widely, ranging from (social) withdrawal to aggressive behavior (Fugate et al., 2012; Junior et al., 2013; P. Leander & Chartrand, 2017). Past research led to detailed knowledge about various instances in which this occurs. One general process, however, always seems to be the same: a threat to any relevant goal triggers some kind of reaction in people. Against this background, there are first attempts to uncover the bigger picture behind threat origin and need dissatisfaction (Deci & Ryan, 2000; Jonas et al., 2014; P. Leander & Chartrand, 2017; Reiss et al., 2021)<sup>1</sup>. The current study deals with a small part of this larger project as follows.

In line with the self-determination theory, Reiss et al. (2021) claim that there are three basic psychological needs: humans strive to feel (1) as autonomous actors of their life, (2) related to others in a positive way, and (3) competent in what they do. Against this, they propose a systematic categorization of psychological threats, for instance according to their origin. This implies a primary connection between psychological threats from the (1) personal

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1 Research on the various (behavioural) reactions to threats (e.g., Fritsche et al., 2011; Taylor et al., 2020; Terry et al., 2013) is part of the current project's *larger* theoretical background. However, our meta-analysis only includes threats and needs, leaving reactions to threat aside. This is possible because the two following processes are related but still distinct: (1) any threat menaces human need fulfillment and (2) *reactions* to threat aim at the defence/restoration of the endangered need(s) (Deci & Ryan, 2000; Gillet et al., 2015; Xu & McGregor, 2018).

context and the need for autonomy, (2) social sphere and the need for belongingness and, (3) physical world and the need for competence. To our knowledge, there exists not yet any empirical study on these connections. We thus conduct a meta-analysis to test (1) their first two<sup>2</sup> hypotheses and (2) the underlying assumption that psychological threats generally lead to need dissatisfaction (e.g., competence, autonomy and, belongingness). A meta-analytic approach is well-suited for our purposes as it allows to summarize the vast threat-need literature in a focused way to test some basic assumptions that stem from a solid scientific framework (Allen, 2020; Hohn et al., 2020; Sharpe & Poets, 2020).

As Reiss et al. (2021) did formulate their hypotheses while proposing a larger theoretical account (their *Taxonomy of Psychological Threat and Threat Responses*), they did *not* (yet?) tailor them specifically to a meta-analytic investigation. Thus, their definitions (threat: social origin or personal origin) require some more explicitness to translate into this research method. We resolve this by testing Reiss et al.'s (2021) assumptions based on *our interpretation* of their threat distinction. The construal-level theory (Trope & Liberman, 2010; Wang et al., 2021) as well as the social identity theory (Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000) serve as a theoretical basis and background for this. In other words, the current meta-analysis is not a direct test of Reiss et al.'s (2021) claims, but rather a close approximation to such a project.

Put simply, we construe Reiss et al.'s (2021) threat distinction (origin: social or personal) along two continua<sup>3</sup>: (1) Based on the construal-level theory (Trope & Liberman, 2010; Wang et al., 2021), we suggest a spectrum that ranges from threat origin based on the

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2 Due to the limited scope of the current project, we do not test Reiss et al.'s (2021) third hypothesis.

3 For some further clarification, see figure 2.

*direct* confrontation with *concrete others*<sup>4</sup> (threat: social origin) to threat origin based on the *indirect* confrontation with *abstract others* (threat: personal origin). In other words, we apply the construal-level theory so that Reiss et al.'s (2021) threat distinction becomes tangible and applicable to the categorization of various threat instances. Thus, our first continuum is a possible translation of their distinction into more explicit terms, suitable for a meta-analytic investigation. (2) Based on the social identity theory (Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000), we propose the addition of a second continuum that further clarifies our interpretation of the given threat distinction (origin: social or personal). In short, we argue that each of the two threat categories entails threats that primarily menace either the personal identity or the social identity of the affected individual. While this may seem counter-intuitive at first, the following explanation of our approach illustrates its advantages.

### **Psychological Threats**

Strictly speaking, all kinds of threats that humans may encounter are psychological threats. In other words, for this definition it does not matter whether the threat expresses itself via the own body (e.g., HIV infection, Alzheimer's disease, etc.) or via the psycho-social context (e.g., social rejection, climate crisis, etc.). What such different cases have in common is that they impede people's goal-achievement<sup>5</sup> who then react to this in some way, e.g., via defensive behavior. This threat-reaction process is often (partially) unconscious and can take various forms, ranging from social withdrawal to aggression. In short, a psychological threat can be anything that poses a risk to an individual's relevant aim/s and thus provokes some kind of response (Baumeister et al., 2007; Deci & Ryan, 2000; Jonas et al., 2014; P. Leander &

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4 Throughout the current paper, we use the term "others" to denote "other human beings".

5 There also exist other definitions of psychological threat, e.g., Jonas et al. (2014) further describe threat as the experience of a discrepancy because it disrupts people's *expected* course of events. Due to the scope and purpose of this paper, an extensive discussion on alternative definitions of threat is neither possible nor necessary.

Chartrand, 2017; Ostergren et al., 2017; Quinlivan et al., 2013; Stollberg & Jonas, 2021; Xu & McGregor, 2018).

Throughout the past years, much literature on *discrete* threats accumulated. The general definition of threat as given above underlies many of these projects (Greenaway & Cruwys, 2019; Jonas et al., 2014; Reiss et al., 2021). However, their research focus varies widely, ranging from distinct threats such as work demands to Alzheimer's disease or the COVID-19 pandemic (Gillet et al., 2015; Ostergren et al., 2017; Šakan et al., 2020). On a selection of this literature, there exist more overarching theories (e.g., intergroup threat theory; the source model of group threat; the temporal need-threat model of ostracism) and/or meta-analyses that presuppose certain threat categories such as rejection threat or self-esteem threat (Gerber & Wheeler, 2009; Greenaway & Cruwys, 2019; Ren et al., 2018; Stephan et al., 2009; vanDellen et al., 2011).

Given this large literature base, some researchers (e.g., Jonas et al., 2014; Jonas & Mühlberger, 2017; Reiss et al., 2021) propose a still more extensive approach to the topic. In other words, they argue that the following question becomes crucial: is it possible to uncover an overall pattern that underlies the threat literature, i.e., to categorize *all* of the various threats in an even more systematic way? In other words, their focus is not only on separate threat categories (e.g., group threat, mortality threat, etc.) but on the distinction of threat categories in relation to each other. Such an overview may enable a profound understanding of the current threat literature and further research projects on the topic, i.e., by guiding the latter. For example, a comprehensive threat framework may illustrate the differences and similarities between distinct (1) threat categories and (2) their effect on human behavior, thus uncovering

the crucial connections between the many independent research findings (Jonas et al., 2014; Reiss et al., 2021).

To date, there are first proposals for such a threat categorization but, they did not yet became topic of much empirical research<sup>6</sup> (Jonas et al., 2014; Reiss et al., 2021). For the current project, we thus focus on a small aspect of this larger endeavor: the distinction between threats that stem from the social sphere versus those from the personal sphere. To our knowledge, Reiss et al. (2021) were the first ones to suggest that this specific distinction holds for all kinds of threats<sup>7</sup>. Via their *Taxonomy of Psychological Threat and Threat Responses*, the authors offer categories to classify any given threat (e.g., according to phenomenological origin, affect, etc.) and report preliminary experimental evidence in support of the assumption that some kind of threat clusters exist.

The particular threat distinction based on phenomenological origin (social or personal), however, was not focus of their empirical investigation and still requires some further vindication and conceptualization<sup>8</sup>. In this paper, we thus offer and apply our interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal). As a theoretical basis and background for this, we refer to the construal-level theory (Trope & Liberman, 2010; Wang et

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6 To give just one example of empirical research that investigates psychological threat from a more comprehensive perspective: recently, Jutzi et al. (2020) applied the General Process Model of Threat and Defense to data on human reactions to the COVID-19 pandemic. Based on this, they propose a general explanation for various, ostensibly distinct responses to the pandemic.

7 Asbrock & Fritsche (2013), Huddy et al., (2002) and Onraet & Van Hiel (2013) also suggest the division of threats into social and personal ones. However, their conceptualization only applies to the context of terrorism (e.g., personal threat: fear of experiencing terrorist attacks at first hand; social threat: fear of experiencing societal consequences of such attacks). In contrast to that, Reiss et al.'s (2021) distinction between social- and personal threats refers to all kinds of threats (i.e., not only terrorism threat). Hence, their terminology requires a more fundamental conceptualisation.

8 As a side note: Reiss et al., (2021) also suggest a sub-category of threats that stem from the physical sphere. Due to the limited scope of this project, we do not investigate this further. For a discussion of the implications of this, see section: limitations.

al., 2021) as well as to the social identity theory (Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000) as follows.

***From the Construal-Level Theory to Our Interpretation of Threat Origin (Social/Personal)***

The construal-level theory is a rather broad framework that may explain various human phenomena such as the processes that underlie stereotypes, decision-making or activism. One reason for the theory's diverse application probably lies in the broad scope of its basic premise: the assumption is that any person construes the world from their very own perspective which entails four dimensions (i.e., temporal, hypothetical, spatial, human<sup>9</sup>). In other words, there always is a gap that leaves some room for individual interpretation of the world (Adler & Sarstedt, 2021; Trope & Liberman, 2010; Wang et al., 2021). The construal-level theory denotes this space between the own standpoint and anything else as *psychological distance*. The lower the psychological distance to a certain matter is, the more concrete that matter is to the affected person (*low-level construal*). In contrast, a high psychological distance to any given event implies a more abstract interpretation of it (*high-level construal*). Regarding psychological distance and level of construal, the just mentioned dimensions (i.e., temporal, hypothetical, spatial, human) may coincide<sup>10</sup> or differ from each other<sup>11</sup> (Hess et al., 2018; Trope & Liberman, 2010).

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9 Following the construal-level theory, the labels of these four dimensions actually are: temporal, hypothetical, spatial, *social* (Trope & Liberman, 2010). Throughout the current paper, we use the term 'human' dimension when referring to the 'social' dimension. This seems beneficial in order to avoid any confusion with the *threat category* 'social' origin.

10 Two examples: '*In this very moment, I am in my hometown and talk to my best friend.*' (low-level construal on all dimensions: temporal, hypothetical, spatial, human), '*Next year, I might be in a foreign town and see to a stranger.*' (high-level construal on all dimensions).

11 Two examples: '*In this very moment, I am in my hometown and see a stranger.*' (low-level construal on all dimensions, except for human), '*Next year, I might be in a foreign town and talk to my best friend.*' (high-level construal on all dimensions, except for human).

We base our interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal) on the construal-level theory (Hess et al., 2018; Trope & Liberman, 2010) to achieve tangible categories that allow for a meta-analytic investigation. For this purpose, we integrate only the last one of the available dimensions (i.e., temporal, hypothetical, spatial, human)<sup>12</sup> (Hess et al., 2018; Trope & Liberman, 2010). Given this, any threat lies somewhere on the *human dimension* from low to high psychological distance (*others – self*) and from low-level to high-level construal of the *social context* (i.e., from *concrete others* to *abstract others*). Furthermore, this continuum consists of four categories – two for each of the given threat categories (origin: social or personal). Figure 1 shows this theoretical framework, including the proposed criteria for threat classification and some examples for each of its threat sub-categories. In order to further reduce any ambiguity regarding our interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal), we expand it via the social identity theory (Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000) as follows.

#### ***Adding a Social Identity Perspective to Our Interpretation of Threat Origin (Social/Personal)***

The focus of the social identity theory rests on the ways in which people see/understand themselves in relation to others (self-concept). According to the account, someone's self-concept results from the interplay between themselves and (1) other individuals as well as (2) the groups that they (not) belong to. This involves three main processes: (1) humans perceive others and themselves as individual beings as well as a part of certain groups<sup>13</sup> (social categorization), (2) their own group affiliation influences their cognition and behavior (social

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<sup>12</sup> The present literature on the construal-level theory already includes studies which consider only some of the four dimensions, leaving other ones aside (e.g., Ejelöv et al., 2018; Norman et al., 2016).

<sup>13</sup> Social categorization does not equal complete conviction with all aspects of the given group. Within the group, there always exists some amount of heterogeneity due to members who fit (less) well into it. Moreover, group membership does not necessarily imply sympathy with fellow group members (Hogg, 2016).

identification) (3) and this (unconscious) differentiation from other groups maintains the existence of distinct groups. Usually, people contrast the own group/s with other ones and thereby, enhance their own self-esteem (social comparison; Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000).

From their own categorization into certain groups, people derive their social identity<sup>14</sup>. However, they also have a personal identity due to their unique qualities as individual beings (e.g., life history, acquired skills, etc.). Both together constitute the self-concept of a person and the available contextual factors determine which one of the two identity categories primarily governs a given situation. While the social identity highlights group-related goals, personal goals may still be available (e.g., the desire for group membership) and vice versa (Ashforth & Mael, 1989; Hogg, 2016; Stets & Burke, 2000).

Against this background, we expand our interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal) so that the classification of threats becomes still more explicit. More precisely, we suggest that both of the threat categories (origin: social or personal) contain threats that primarily affect either the personal identity or the social identity of the affected individual, depending on the specific context variables of the given threat. In other words, this second continuum ranges from personal identity prevalence to social identity prevalence. Figure 2 shows this addition and captures thus the complete theoretical framework for our interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal), including some examples<sup>15</sup>.

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<sup>14</sup> The social identity may also be salient in contexts in which people do not face the relevant group (e.g., preparing a meal from the own culture in a foreign country; Hogg, 2016).

<sup>15</sup> For more examples regarding the classification of threats according to our theoretical framework, see Appendix A.

**Figure 1**

*Our Basic Interpretation of Reiss et al.'s (2021) Threat Distinction (Origin: Social/Personal)*

Hypothesized Associations (Current Study)	Threat from Social Origin x Belongingness Need Dissatisfaction		Threat from Personal Origin x Autonomy Need Dissatisfaction	
Threat	<b>THREAT: SOCIAL ORIGIN</b>		<b>THREAT: PERSONAL ORIGIN</b>	
Based on: Construal-Level Theory	<b>Direct confrontation with others</b>	<b>Recurring experiences of similar, direct confrontations with others</b>	<b>No direct confrontation with various others but interpersonal context available (including self-comparison with others)</b>	<b>Neither direct others nor social context prevalent (but larger social context may be available)</b>
Examples	Social exclusion (e.g., rejection by own friends, exclusion based on favourite soccer team)	Lifetime experience with social exclusion, consequences from social exclusion (e.g., “If I want to see my friends, I am usually the one who must contact them.”)	Parental unresponsiveness, abusive relationship, awareness of facing stereotype threat, structural discrimination	Climate crisis, mortality, disease (e.g., cancer), rise of tuition fees
Based on: Construal-Level Theory	<b>Low-level construal of social context (concrete others)</b>			<b>High-level construal of social context (abstract others)</b>
Psychological Distance	<b>Low distance (others – self)</b>			<b>High distance (others – self)</b>
Continuum from low to high Psychological Distance: Others – Self & from low to high Construal Level of Social Context: Concrete – Abstract				

**Figure 2**

*Our Complete Interpretation of Reiss et al.'s (2021) Threat Distinction (Origin: Social/Personal)*

Hypothesized Associations (Current Study)	Threat from Social Origin x Belongingness Need Dissatisfaction		Threat from Personal Origin x Autonomy Need Dissatisfaction		
Threat	<b>THREAT: SOCIAL ORIGIN</b>		<b>THREAT: PERSONAL ORIGIN</b>		
Based on: Social Identity Theory	<b>Personal Identity prevalent</b> (e.g., life history, individual traits, acquired skills, etc.)				Continuum from Personal Identity to Social Identity prevalent
Based on: Construal-Level Theory	<i>Direct</i> confrontation with others (based on personal identity)	Recurring experiences of similar, <i>direct</i> confrontations with others	No direct confrontation with various others but interpersonal context available	Neither direct others nor social context prevalent	
Examples	Social exclusion with focus on personal identity (e.g., favourite soccer team)	Lifetime experience with social exclusion based on personal identity	Parental unresponsiveness; abusive relationship	Climate crisis, mortality, disease (e.g., cancer)	
Based on: Social Identity Theory	<b>Social Identity prevalent</b> (i.e., based on categorization to/differentiation from certain groups)				
Based on: Construal-Level Theory	<i>Direct</i> confrontation with others (based on social identity)	Recurring experiences of similar, <i>direct</i> confrontations with others	No direct confrontation with others but self-comparison with others	No <i>direct</i> others but larger social context available	
Examples	Social exclusion with focus on social identity (e.g., rejection by own friends)	Consequences from social exclusion (e.g., "If I want to see my friends, I am usually the one who must contact them.")	Awareness of facing stereotype threat, structural discrimination, etc.	Rise of tuition fees	
Based on: Construal-Level Theory	<b>Low-level construal of social context</b> (concrete others)			<b>High-level construal of social context</b> (abstract others)	
Psychological Distance	<b>Low distance</b> (others – self)			<b>High distance</b> (others – self)	
Continuum from low to high Psychological Distance: Others – Self & from low to high Construal Level of Social Context: Concrete – Abstract					

### **Basic Needs**

In the literature on psychological threats, psychological needs often play a substantial role. The underlying assumption is that these needs specify people's aims and thus, matter for the investigation of psychological threat as: anything that poses a risk to an individual's relevant goal/s hence, provoking some kind of response (Deci & Ryan, 2000; Gillet et al., 2015; N. P. Leander et al., 2020; P. Leander & Chartrand, 2017). For the current project, we apply a need definition that stems from the self-determination theory as follows.

According to the self-determination theory, the motivation for human behavior rests on three basic needs that they aim to satisfy throughout their life: the need for competence, autonomy and, belongingness. In other words, optimal well-being, functioning and progress depends on the fulfillment of these and thus, they underlie/drive any human action. While these behaviors may vary based on individual factors such as culture and age, the basic needs themselves remain the same across contexts (Chen et al., 2015; Gagné & Deci, 2014; Ryan & La Guardia, 2000). This assumption of an underlying, universal process also holds when it comes to threats which pose a risk to need-fulfillment. Put differently, humans may react in different ways to such intimidating situations but, they all still act based on (reaching/defending their fulfillment of) the same basic desires (Chen et al., 2015; Gagné & Deci, 2014; Ryan & La Guardia, 2000).

In certain contexts, such threats may affect all three needs to a significant extent (competence, autonomy and, belongingness). Possible examples may occur at the workplace, in the school/sport context or, under the living conditions during the COVID-19 pandemic (Bartholomew et al., 2011; Cantarero et al., 2021; Gillet et al., 2015; Jang et al., 2016). However, the distinct components of such broad threats may primarily target only one of the

basic needs (competence, autonomy or, belongingness). Work-related stress, for example, may pose a competence threat via tasks that exceed co-workers' expertise, decrease their autonomy via restrictive role expectations and, menace their belongingness need via social exclusion at their workplace (Olafsen et al., 2017; Reiss et al., 2021).

### ***The Need for Competence***

Following the self-determination theory, the need for competence consists in the desire for challenges as well as the ability to acquire and perform the relevant skills to master these (Gagné & Deci, 2014; Ryan & La Guardia, 2000). For example, video games may be entertaining by offering tasks at the appropriate level of difficulty so that the gamer can solve these and thereby, satisfy their competence need (Rogers, 2017; Ryan et al., 2006). In contrast, economic danger or tasks above the personal skill level are two of the threats that may pose a risk to competence need fulfillment because they decrease people's possibilities for efficient action (Dupuis & Newby-Clark, 2016; Wakeman et al., 2019)<sup>16</sup>.

### ***The Need for Autonomy***

According to the self-determination theory, the need for autonomy entails the impression of acting in a self-paced way, e.g., primarily based on personal- rather than group-related considerations. In other words, a person may still act in line with their group's interests but, based on the own, free choice to do so. As these personal interests may align with those of their culture, autonomy need fulfillment is possible across cultures (i.e., individualistic or collectivist). In other words, the autonomy need does not entail selfishness but self-

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<sup>16</sup> Explanatory note: Reiss et al. (2021) assume a relationship between threats from the *physical* sphere and the need for competence. Due to the scope of the current project, we do not investigate this further and only test their hypotheses regarding associations between (1) threats from the *social* sphere and the need to belong and (2) threats from the *personal* sphere and the need for autonomy. However, we include the need for competence for our investigation of the underlying assumption that there is an association between psychological threats (in general) and basic need dissatisfaction.

determination (Chirkov et al., 2003; Gagné & Deci, 2014; Ryan & La Guardia, 2000). Among other issues such as economic danger, a HIV infection may pose a threat to the autonomy need, e.g., due to an *unexpected* diagnosis, related stigmatization or the dependence on medical treatment which may all restrict self-reliant choice of action (Dupuis & Newby-Clark, 2016; Quinlivan et al., 2013).

Following our theoretical framework (see table 2), a HIV infection is thus a threat that lies on the personal side of the continuum from ‘threat: social origin’ to ‘threat: personal origin’<sup>17</sup>. More precisely, the menacing component of this infection does not primarily arise from the social context of the affected individual. Even if the social context may be available, the given threat does not mainly concern the direct confrontation with various others. Considering this classification and the above research findings, the given example is in line with Reiss et al.’s (2021) assumption of an association between personal threats and autonomy. To our knowledge, there is not (yet) any other literature on this very specific topic available.

### ***The Need for Belongingness***

Following the self-determination theory, it is important to *not* define the need for belongingness as the mere contrary of the autonomy need. Rather, it consists in perceptions of the social context which are not directly related to specific actions/abilities of the individual. Possible examples are feeling as a member of a given group, being connected with others or, experiencing caring and loving relations (Gagné & Deci, 2014; Ryan & La Guardia, 2000). For instance, this may explain the experience of homesickness: the spatial distance to their family, friends or, colleagues may pose a threat to people’s belongingness need (Watt & Badger, 2009).

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<sup>17</sup> For the sake of completeness: according to our theoretical framework, a HIV infection primarily menaces the affected person via their *personal identity* (i.e., the categorization to/differentiation from certain groups is subordinate). However, this detail is not relevant for the above reasoning.

Another example for a belongingness threat is the experience of isolation due to the contact restrictions throughout the COVID-19 pandemic, e.g., remote work may decrease the contact to other employees (Gratz et al., 2020).

According to our theoretical framework (see figure 2), both of the above threats lie on the social side of the continuum from ‘threat: social origin’ to ‘threat: personal origin’. The reason for this is the low-level construal based on rather concrete others (e.g., family or colleagues) and the low psychological distance between these others and the self. As outlined above, our framework only takes into account the *human* dimension and leaves the other three dimensions (e.g., the spatial dimension) of the construal-level theory (Hess et al., 2018; Trope & Liberman, 2010) aside. More precisely: homesickness and isolation may both be threatening due to the physical distance to others. However, the origin of this threat actually lies within the social context rather than within the personal context. In other words, missing others is only possible given that those others exist *somewhere* (within the social context)<sup>18</sup>. Considering this categorization and the above research findings, the given examples are in concert with Reiss et al.’s (2021) assumption of an association between social threats and belongingness. To our knowledge, there is not (yet) any other literature on this very specific topic available.

### **The Present Study**

As outlined in the previous, there already exists a vast amount of threat-need research and Reiss et al. (2021) aim to uncover its larger pattern via an extensive categorization of distinct threats. Throughout the present project, we only focus on their threat distinction based on origin (social or personal) and the related hypotheses. A meta-analysis is a suitable tool to

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<sup>18</sup> For the sake of completeness: following our theoretical framework, the given examples of homesickness and social isolation primarily threaten the affected person via their *social identity* (i.e., the categorization to/differentiation from certain groups is more prevalent than the personal identity). However, this detail is not relevant for the above reasoning.

test such basic assumptions regarding a broad literature base (Allen, 2020; Hohn et al., 2020; Jonas et al., 2014; Sharpe & Poets, 2020). However, this approach requires very tangible definitions for each of the examined constructs and Reiss et al. (2021) did not (yet?) offer such criteria. Thus, we investigate their assumptions based on *our interpretation* of their threat distinction (origin: social or personal).

More precisely, we test two of Reiss et al.'s (2021) hypotheses, captured in two research questions: are there associations between (1) personal threats and autonomy need dissatisfaction and (2) social threats and belongingness need dissatisfaction? (see: moderation hypotheses) Besides this, we investigate another research question that seems to underlie Reiss et al.'s (2021) assumptions: is there an association between psychological threats and need dissatisfaction more generally? (see: main effect hypothesis)

Main Effect Hypothesis H1: summarizing all effects, we expect to find a positive correlation between psychological threats (personal and social) and basic need dissatisfaction (e.g., competence, autonomy and, belongingness).

Moderation Hypothesis H1a: we expect a stronger positive correlation between personal threats (A) and autonomy need dissatisfaction (B) than personal threats and other need dissatisfaction (e.g., competence, belongingness) (H1a).

Moderation Hypothesis H1b: we expect a stronger positive correlation between social threats (A) and belongingness need dissatisfaction (B) than other need dissatisfaction (e.g., competence, autonomy).

### **Method**

To test the given hypotheses, we conducted a meta-analysis. This method suits the current research questions well as it allows to draw some general conclusions based on data

from various, independent research projects. More precisely, any meta-analysis consists of data on the same topic but, from slightly different research backgrounds, e.g., due to some variation in context, samples, and measurement of the given constructs. In other words, a meta-analytic approach resembles the general idea that underlies the current research project: to uncover the bigger picture behind the accumulated (threat-need) literature (Allen, 2020; Hohn et al., 2020; Reiss et al., 2021; Sharpe & Poets, 2020).

### **Eligibility Criteria**

We included primary data based on quantitative research which offers (the relevant information to calculate) the association between a psychological threat (A) and basic need/s (B), including the relevant effect size. For this purpose, we applied specific definitions of the given constructs (see: operational definition) according to which we grouped the data of the included studies. Examples which illustrate the thereof resulting exclusion criteria are experimental studies with an insufficient control group and studies with results that stem from a median-split<sup>19</sup> or that focused on a related but different construct (e.g., depression).

### **Operational Definition: Psychological Threats**

Following the definition that we applied, a psychological threat is anything that obstructs a goal that is relevant to the affected individual who thus shows some kind of response (Deci & Ryan, 2000; P. Leander & Chartrand, 2017; Xu & McGregor, 2018). As this threat definition is rather broad, it holds for various concepts such as work-related stress, social exclusion or, disease (Gerber & Wheeler, 2009; Olafsen et al., 2017; Quinlivan et al., 2013). Examples of possible threat operationalisations are “I feel excluded.” (Schneider et al., 2017, p. 387) or “Do

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<sup>19</sup> Dichotomization via median-split commonly may lead to methodological problems, e.g., decreases in power and reliability (MacCallum et al., 2002).

you think that your income is (1) far below average, (2) below average, (3) average, (4) above average, or (5) far above average?” (Bradshaw & Ellison, 2010, p. 7).

### **Operational Definition: Basic Needs**

For the current project, we followed a definition that stems from the self-determination theory: basic needs are driving forces that all humans have throughout their life and that consist in the need for competence, autonomy, and belongingness (Gagné & Deci, 2014; Ryan & La Guardia, 2000). Our meta-analysis, however, does not only include research that explicitly applied this very same theoretical account. This was possible because the various need theories usually share comparable core concepts, i.e., need definitions (Jonas et al., 2014; Reiss et al., 2021). Moreover, we screened the acquired data further by coding for the concepts that tap into the specific needs of interest for our mediation hypotheses (autonomy and belongingness) and thus, screened out any divergent concepts. To capture this approach, we discuss the results via the phrasing ‘need dissatisfaction *that is related to* belongingness/autonomy’ instead of ‘belongingness/autonomy need dissatisfaction’. Examples of possible need operationalisations include (for autonomy:) “I feel that the decisions I make at work reflect what I really want” (Olafsen et al., 2021, p. 4), (for competence:) “I feel confident that I can do things well at work” (Olafsen et al., 2021, p. 4) and, (for belongingness:) “I feel that the people I care about at work also care about me” (Olafsen et al., 2021, p.4).

### **Data Collection Process**

Our data collection<sup>20</sup> stems from three different searching approaches, based on: (1) online libraries (i.e., PsycInfo, SocINDEX, PsycArticles, Psychology and Behavioural Sciences

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<sup>20</sup> The data collection process of the current project was part of a larger collaboration with other researchers and students from the University of Groningen. They worked on other research projects on the same threat-need literature base. For more details on this, see Appendix B.

Collection and, EconLit) (2) the reference section of suitable papers, including other meta-analyses (snowball search), and (3) email contact with threat-need researchers. The data acquisition process that was a specific part of the current project took place from September 2021 until December 2021. Based on our coding decisions, we excluded 16 of the studies that passed our initial screening and thus, included a total of 103 studies.

### **Coding Decisions**

#### ***Moderators<sup>21</sup>: Personal Threats versus Social Threats***

Focusing on the phenomenological origin of a given psychological threat, we coded for threats that arise primarily from the personal sphere and for threats that primarily stem from the social sphere. More precisely, this coding procedure implies that a given threat was either classified as resulting mainly from the personal sphere *or* from the social sphere (i.e., dichotomous coding). As outlined in the previous sections, our theoretical framework of threat distinction (origin: social or personal) consists of two *continua*. In practice, we treat the given threat categories (origin: social or personal) as opposites of each other without consideration of the spectrum. For a categorization of these threats with regard to all aspects of our theoretical framework, see Appendix A<sup>22</sup>.

**Personal Threats.** In line with our operational definition, we coded for personal threats when the threat primarily involves either (1) no direct confrontation with various others but the interpersonal context is available (including self-comparison with others) or (2) neither direct

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21 In addition to the variables that were inevitable to test our hypotheses, we also coded for some other moderators as the literature acquisition for this study was part of a larger collaboration. Within our statistical analysis, we did only include the moderators as given in this Methods section. For details on the other ones, see Appendix C.

22 We excluded data on threats that were compounds based on both of our threat categories. To give a hypothetical example of such threats: a threat compound of cyberbullying (social threat) and HIV disease (personal threat).

others nor a prevalent social context (but the larger social context may be available). Possible examples are “You worry about getting Alzheimer’s someday.” (Ostergren et al., 2017, p. 5) or “In the MS [mortality salience condition] participants were asked to describe their emotions and thoughts that their own death arouses in them.” (Fritsche et al., 2010, p. 70)

**Social Threats.** According to our operational definition, we coded for social threats given that the threat primarily involves either (1) a direct confrontation with others or (2) recurrent experiences of similar, direct confrontations with others. Possible examples are “Please think of a time when you had a fight with someone close to you.” (Troisi et al., 2015, p. 60) or “My coach intimidates me into doing the things that he/she wants me to do.” (Bartholomew et al., 2011, p. 1462).<sup>23</sup>

***Moderators: Need for Autonomy and Need for Belongingness***

According to the self-determination theory, the autonomy need is not the mere opposite of the belongingness need (Deci & Ryan, 2000; Gagné & Deci, 2014). To capture this, we coded for concepts that tap into one of these needs (autonomy or belongingness) independently instead of using a single, dichotomous coding procedure (as we did in the case of psychological threats: social or personal).

**Need for Autonomy.** We coded for concepts that tap into the need for autonomy based on its definition according to the self-determination theory, i.e., acting based on self-determined decisions (Deci & Ryan, 2000; Gagné & Deci, 2014). Possible examples include “I get to do interesting things in this class” (Jang et al., 2016, p. 31) “I feel that the decisions that I make at work reflect what I really want” (Olafsen et al., 2021, p. 4).

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<sup>23</sup> For more examples concerning our coding of threats (origin: social or personal), see Appendix A.

**Need for Belongingness.** We coded for concepts that tap into the need for belongingness based on its definition according to the self-determination theory, i.e., experiencing positive interpersonal connections/relationships (Deci & Ryan, 2000; Gagné & Deci, 2014). Possible examples are “I feel close and connected with people in this class” (Jang et al., 2016, p. 31) or “I feel that people I care about at work also care about me” (Olafsen et al., 2021, p. 4).

### **Concerning the Applied Statistical Approach**

The eligibility criteria that we used for our data acquisition primarily apply to correlational literature. For each effect added to our database, we thus used the Pearson correlation coefficient  $r$  as a measure of the effect size. If not reported by the authors, we recorded the given means and standard deviations based on which the data analysis included the calculation of the missing Pearson's  $r$  values. We then applied Fisher's  $r$  to  $z$  transformation (Viechtbauer, 2010) for the calculation of the weighted means of the effect sizes. The reason for this was the fitting of the meta-analytic model, based on assumptions of an (approximately) normal distribution and (approximately) known variances between the individual studies (Harrer et al., n.d.-a; Viechtbauer, 2010).

To conduct the analyses on statistically independent data, we treated independent samples as independent data points. In cases of multiple effect sizes per sample, we compensated for statistical interdependence by (1) calculating their average effect if possible or (2) averaging these effect sizes out if they resulted from differences in research questions (Viechtbauer, 2010). Hence, the amount of effect sizes per independent sample was smaller than the total amount of investigated effect sizes. Following Cohen (1992), we considered effect sizes of .50 as large, .30 as medium, and 0.10 as small.

We used R (R Core Team, 2019), R studio (Rstudio Team, 2020), the *metafor* packages (Viechtbauer, 2010, 2017) and data wrangling packages such as dplyr (Wickham et al., 2021) to test our hypotheses via a random-effects model analysis. This model takes into account the additional variability within meta-analytic data that results from the variability between the included studies (e.g., differences in sample, study design, or measurement of the given construct). To test this assumption of heterogeneity, we used (1) the Cochran's Q statistic which, if significant, indicates heterogeneity for the compiled database and (2) the tau-squared statistics because the former one is not sensitive to sample size and thus, accuracy of the included studies (Harrer et al., n.d.-b).

#### ***Concerning the Tests of Hypotheses***

To test our three hypotheses regarding a potential main effect and two potential moderator effects, we conducted analyses of variance based on meta-regression. As our statistical analysis only included categorical variables, we applied dummy coding. To test our moderation hypotheses, we used the QM statistic which is an estimator of between-group variance and if significant, indicates that there is a difference between groups (Harrer et al., n.d.-b). We transformed all of the relevant correlations back to Pearson's r values to ease the interpretation of results (Viechtbauer, 2010).

#### ***Concerning the Assessment of Publication Bias***

To account for the possibility of publication bias within the included literature base, we used the following three methods. (1) For detection of publication bias, we used a contour-enhanced funnel plot. This scatter plot shows (A) the distribution of studies based on their reported effect size against the given standard error and (B) the significance level of each given study. A symmetrical pattern indicates the absence of a publication bias (Harrer et al., n.d.-c).

(2) Together with the funnel plot, we applied the trim and fill method which gives an estimation of the true distribution of effects in case of a present publication bias. (3) To target and correct for publication bias that may result from studies with small sample sizes, we applied the PET-PEESE method (a combination of a precision-effect test and a precision-effect estimate with standard error). Following this method, a skewed best fit line indicates the presence of publication bias. Besides this, the method offers adjusted regression lines in case of present publication bias (Harrer et al., n.d.-c). To visualize (the database upon which we performed) the statistical analysis of the moderation hypotheses, we used a forest plot which depicts the included studies (effect size and confidence interval) as well as the meta-analytic result (their pooled effect (Harrer et al., n.d.-c)).

## Results

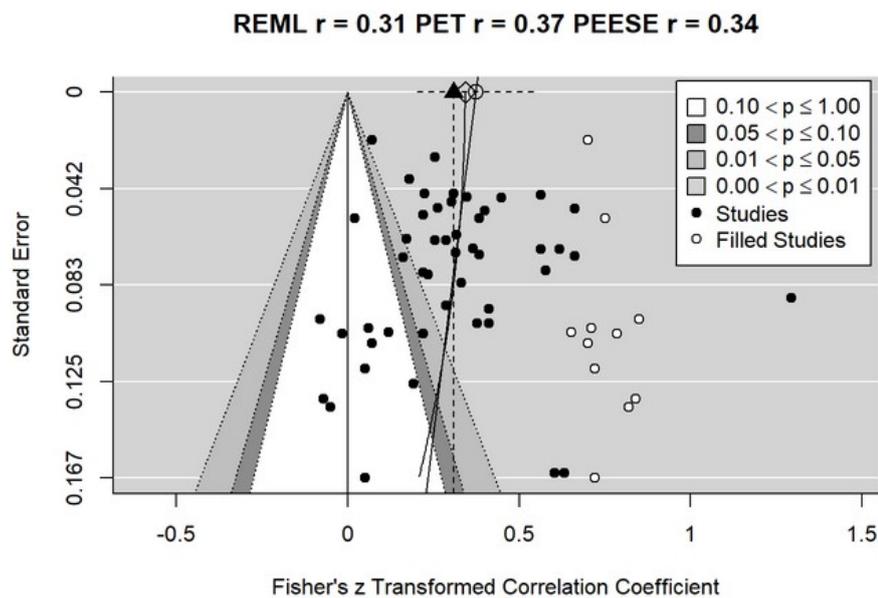
### Main Effect Hypothesis

Our literature search and selection process led from an initial inclusion of 119 studies to the exclusion of 16 studies based on our coding decisions. This left 116 need-threat correlations from 103 research papers upon which we tested our main effect hypothesis H1: summarizing all effects, we expect to find a positive correlation between psychological threats (personal and social) and basic need dissatisfaction (e.g., competence, autonomy, belongingness). The tests of heterogeneity justified a random-effects model analysis ( $Q_E = 1862.02$ ,  $df = 115$ ,  $p < 0.0001$ ;  $T^2 = .16$  (SE = .023)) and suggested the presence of moderator variables that may explain the large variance within the database. The results from the meta-regression indicate a strong positive correlation between psychological threats and basic need dissatisfaction ( $r = 0.49$ ,  $p < .0001$ , 95% CI [0.43, 0.55]), thus supporting our main effect hypothesis.

The approximately normally distributed scores within the funnel plot (figure 3) and the forest plots (see: Appendix D, Figures A1 – A7) suggested the absence of any publication bias for the examined database. This is in accord with the best fit line based on the PET-PEESE method which shows only minor skewness. Taken together, this indicated the irrelevance of any bias correction based on other values from the trim and fill method or from the PET-PEESE method.

**Figure 3**

*Funnel Plot with Trim-Fill/PET-PEESE Estimates and Average Meta-Analytic Effect (REML r)*



**Moderator Effect Hypotheses**

To test whether the type of threat (social or personal) indeed makes a difference regarding the association between psychological threats and basic need dissatisfaction (e.g., competence, autonomy, belongingness), we conducted a moderation analysis. The number of included need-threat correlations was higher for this and the following moderation analyses than

for the test of our main effect hypothesis because of our moderator coding.<sup>24</sup> From the total of 126 included need-threat correlations, 26 included only personal threats, 92 included only social threats and 8 did not include any of these two threats. The significant test of moderators indicated that type of threat indeed moderates the relationship between psychological threats and basic need dissatisfaction ( $Q_M = 20.59$ ,  $df = 123$ ,  $p < .0001$ )<sup>25</sup>. In other words, this suggests that our interpretation of Reiss et al. (2021) threat distinction (origin: social or personal) captures a noticeable pattern in the included threat-need literature, at least to some extent.

We conducted a second moderation analysis to test the first one of our two moderator effect hypotheses: we expect a stronger positive correlation between personal threats (A) and autonomy need dissatisfaction (B) than personal threats and other need dissatisfaction (H1a). More precisely, we investigated whether autonomy need moderates the association between personal threats and basic needs. From the 30 included need-*personal threat* correlations, 22 were related to the autonomy need and 8 were not. The test of moderators was significant ( $Q_M = 7.77$ ,  $df = 1$ ,  $p < .0053$ ) and the results supported our first moderation hypothesis: the correlation between personal threats and need dissatisfaction that is related to autonomy ( $r = 0.38$  [0.29, 0.47]) was stronger than the one between personal threats and need dissatisfaction that is not related to the autonomy need<sup>26</sup> ( $r = 0.22$  [0.16, 0.29]).

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24 More precisely: for the main effect analysis, the effects were grouped by the specific sample that they stem from. For the moderation analyses, the effects were additionally separated based on the moderator of interest, i.e., threat category (social or personal); belongingness need dissatisfaction; autonomy need dissatisfaction.

25 As a side note, because the current study did not include any hypothesis regarding the following: the effect of social threats on basic need dissatisfaction ( $r = 0.55$  [0.49, 0.60]) was stronger than that of personal threats on basic need dissatisfaction ( $r = 0.23$  [0.09, 0.36]).

26 Based on our coding decisions (see section: Coding Decisions), we use the phrasing “need dissatisfaction *that is related to* belongingness/autonomy” instead of “belongingness/autonomy need dissatisfaction”. More precisely, we coded for concepts that tap into these needs instead of coding for these needs in particular, as explained in the Methods section.

We conducted a third moderation analysis to test our second moderation effect hypothesis: we expect a stronger positive correlation between social threats (A) and belongingness need dissatisfaction (B) than social threats and other need dissatisfaction (H1b). From the 124 included need-*social threat* correlations, 55 were related to the belongingness need and 69 were not. The test of moderators was significant ( $Q_M = 11.35$ ,  $df = 1$ ,  $p < .0008$ ) and the results supported our second moderation hypothesis: the correlation between social threats and need dissatisfaction that is related to belongingness ( $r = 0.65$  [0.58, 0.71]) is stronger than the correlation between social threats and need dissatisfaction that is not related to belongingness ( $r = 0.44$  [0.33, 0.54]).

### Discussion

Based on Reiss et al's (2021) call for a comprehensive classification of various distinct threats, the current investigation focused on a small aspect of this larger endeavor. Following their proposed threat distinction according to phenomenological origin (social or personal), our aim was to test two of their related hypotheses, namely: there is a primary connection between (1) personal threats and autonomy need dissatisfaction and (2) social threats and belongingness need dissatisfaction. Furthermore, we examined the underlying assumption that psychological threats generally lead to basic need dissatisfaction. For this purpose, a meta-analysis was our method of choice because it may uncover the bigger picture behind an extensive literature base via some predetermined basic assumptions (Allen, 2020; Hohn et al., 2020; Sharpe & Poets, 2020) – conditions that the current project met.

However, the conceptualization of Reiss et al.'s (2021) threat distinction (origin: social or personal) required some more explicitness to translate into this research method. Thus, we established and applied our interpretation of their classification during the current project. As a

theoretical background for this, we used the social identity theory (Hogg, 2016; Stets & Burke, 2000) as well as the construal-level theory (Hess et al., 2018; Trope & Liberman, 2010). In short, the thereof resulting framework (see figure 2) implies a categorization of threats along two continua: (1) from low-level to high-level construal of the social context, including the confrontation with concrete/abstract others and (2) from personal identity prevalence to social identity prevalence.

Against this background, the results of the current study point to a significant positive relationship between psychological threats (personal and social) and basic need dissatisfaction. This supports our main effect hypothesis. In light of the already present and vast literature base on positive associations between threats and their effect on basic need/s (Gerber & Wheeler, 2009; Kay et al., 2009; Šakan et al., 2020), this evidence may actually seem superfluous. In other words, an insignificant result regarding the given hypothesis would have been very surprising. On the other hand: to our knowledge, there did not yet exist such a *broad* investigation of the relation between *various* psychological threats (e.g., mortality, exclusion, financial hardship, etc.) and general basic need dissatisfaction prior to the current study. In other words, the current finding simply results from the use of meta-analysis as a tool “to eliminate random sampling error and identify systematic influence of artifact” (Allen, 2020, p. 90) as various authors advocate (Mathur & VanderWeele, 2021).

In contrast to our main effect hypothesis, the given moderation assumptions covered topics that received almost no attention within the previous threat-need literature: the comprehensive categorization of distinct threats (Jonas et al., 2014; Reiss et al., 2021). In line with our first moderation hypothesis, the current findings suggest a significant positive association between personal threats and autonomy need dissatisfaction. Due to the lack of

other research on the specific threat category (threat origin: personal) upon which this result rests, discussing it within the context of further literature does not seem reasonable.

This absence of other available research on the issue also applies to our second moderation hypothesis because it implies our interpretation of Reiss et al.' (2021) second threat category (threat origin: social). In accordance with that second assumption, the current results point to a significant positive association between social threats and belongingness need dissatisfaction. In summary: the present findings suggest that psychological threats (personal and social) lead to general basic need dissatisfaction which entails the following pattern. While personal threats especially menace autonomy needs, social threats have a pronounced impact on belongingness need dissatisfaction.

Taken together, the current results suggest that the (interpretation and) application of Reiss et al.'s (2021) proposed threat distinction (origin: social or personal) indeed shows some underlying pattern within the already available database on distinct threats. Given this, it seems promising to further investigate the possible categorization of various threats. Moreover, the present findings give some preliminary support for our interpretation of Reiss et al.'s (2021) threat distinction (social or personal) and the practical application of it.

### **Limitations**

“To do meta-analysis properly, one must acknowledge its limitations and then use it thoughtfully, prudently, and publically. Objectivity is elusive if not impossible; subjectivity must be humbly and respectfully embraced.” (Sharpe & Poets, 2020, p. 383) The given quotation captures what is most obvious with regard to the limitations of the current project. Any meta-analysis involves some non-objective choices (e.g., concerning the coding operationalisations, the data selection, etc.) but (Sharpe & Poets, 2020), the current one additionally *rests on a*

rather subjective basis: *our interpretation* of Reiss et al.'s (2021) threat distinction (origin: social or personal). Regardless of its plausibility, our theoretical framework and the related investigation deviates from Reiss et al.'s (2021) reasoning. This is especially the case concerning the following two issues.

(1) We used the construal-level theory (Hess et al., 2018; Trope & Liberman, 2010) and the social identity theory (Hogg, 2016; Stets & Burke, 2000) as a theoretical basis for our interpretation while Reiss et al. (2021) themselves did not mention such a connection. (2) Due to the restricted scope of the current project, we did not take into account the third one of Reiss et al.'s (2021) threat categories, i.e., threat origin: physical. Following our interpretation (see figure 2), such threats would probably lie on the extreme side of *threat: personal origin* (i.e., neither direct others nor social context prevalent). However, at this point, it is unclear how such a division of the investigated categories would change the current research findings. Moreover, it remains open whether Reiss et al. (2021) would advocate a comparable interpretation of their threat classification.

There were at least two other limitations that are worth mentioning. Firstly, our particular coding decisions were not examined by more than two independent people. The reason for this was the limited scope of the current project. Secondly, the lack of available literature on the very specific topic of the current investigation (i.e., the applied threat categories and the related hypotheses) restricted the discussion/interpretation of the reported results.

### **Implications/Future Research**

The current project provided some preliminary evidence that suggests the practical application of Reiss et al.'s (2021) threat distinction (origin: social or personal), at least via our

interpretation of it. The same applies to Reiss et al.'s (2021) hypotheses regarding associations (1) between social threats and belongingness need dissatisfaction and (2) between personal threats and autonomy need dissatisfaction. Based on this, future research could target at least three issues.

Firstly, a further investigation of our applied interpretation of Reiss et al.'s (2021) threat distinction (origin: social or personal) would be possible. Based on figure 2, such research could consider the given threat categories as extreme opposites on a *continuum*. Due to the *dichotomous* coding of threat categories, our statistical analysis did not take this into account. Besides this, future research on our theoretical framework could take into account all of its eight threat sub-categories. Secondly, future research could test alternative interpretations of Reiss et al.'s (2021) threat distinction – unless a verifiable clarification by these authors themselves becomes available. Thirdly, insightful research projects may arise from Reiss et al.'s (2021) assumptions regarding primary associations between distinct threat categories and specific basic needs. Especially with regard to the vast amount of threat-need literature, such (meta-analytic) projects seem very feasible (Hohn et al., 2020; Jonas et al., 2014; Reiss et al., 2021)

## **Conclusion**

The current meta-analysis resulted in some preliminary support for the practical application of Reiss et al.'s (2021) threat categorization (origin: social or personal). Based on our interpretation of their threat distinction, the given research findings are in line with Reiss et al.'s (2021) hypotheses that (1) personal threats especially menace autonomy needs and (2) that social threats pose an increased risk to relatedness needs. Besides this, psychological threats lead to basic need dissatisfaction in general. Due to the outlined limitations, the reported

conclusions may only permit a tentative hint to the possible utility of Reiss et al.'s (2021) threat classification for further investigations.

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Appendix A

Our Interpretation of Reiss et al.’s (2021) Threat Distinction (Social/Personal) Applied<sup>27</sup>

Hypothesized Associations (Current Study)	Threat from Social Origin x Belongingness Need Dissatisfaction		Threat from Personal Origin x Autonomy Need Dissatisfaction	
Threat	THREAT: SOCIAL ORIGIN		THREAT: PERSONAL ORIGIN	
Based on: Social Identity Theory	<b>Personal Identity prevalent</b> (e.g., life history, individual traits, acquired skills, etc.)			
Based on: Construal-Level Theory	<i>Direct</i> confrontation with others (based on personal identity)	Recurring experiences of similar, <i>direct</i> confrontations with others	No direct confrontation with various others but interpersonal context available	Neither direct others nor social context prevalent
Examples	Social exclusion with focus on personal identity (e.g., favourite soccer team)	Lifetime experience with social exclusion based on personal identity	Parental unresponsiveness; abusive relationship	Climate crisis, mortality, disease (e.g., cancer)
Applied to Current Meta-Analysis	Imagine a scenario in which your partner in a committed romantic relationship <b>cheats on you</b> (physically and emotionally) <u>[your partner with their affair/s]</u>	After being hospitalized for mental illness, were <u>people comfortable around you?</u>	<u>I feel</u> I’m <b>working too hard</b> on my job	Receiving a <b>bad grade</b> (worse than usual) <u>[self]</u>
		Consider 9 <u>interpersonal situations</u> and rate rejection concern and <b>rejection expectancy</b>	Because I have homosexual/lesbian/bisexual feelings, <b>I don’t feel like myself</b>	<b>Failing</b> at an impossible/very hard intelligence test (Raven’s matrices) <u>[self]</u>
		<b>How many times</b> have you been <b>called a bad name</b> <u>[by others]</u> like (examples)?	<u>Parental unresponsiveness</u>	<b>Failing</b> at an impossible/very hard intelligence test where one is supposed to form words <u>[self]</u>
	<b>Lifetime experience with verbal insults</b> , threats of physical violence, etc. <u>[by others]</u> because of them being gay,		In childhood, <b>being yelled at</b> <u>[by parent]</u> , etc.	<b>Failing</b> at an impossible/very hard intelligence test where one is asked to form associations <u>[self]</u>

Continuum from Personal Identity to Social Identity prevalent

<sup>27</sup> The examples in the table (see: Applied to Current Meta-Analysis) stem from the research papers that we included in the current meta-analysis.

	lesbian, bisexual or transgender			
	Incident described in a scenario and then asked <b>how likely this incident was due to prejudice</b> [by others] (e.g., gender)	Memories concerning upbringing regarding <b>rejecting parent</b>	Not getting something was <b>illegitimate</b> [abstract context]	
	<b>Expected rejection:</b> I am afraid to be made fun of [by others] because of my sexual orientation	Participants were given quotes from the Bible that told that <b>god</b> would <b>abandon them</b>	<b>General GPA</b> [self/abstract others: education context]	
	<b>I experience discrimination</b> [from others] because of my ethnicity/race	The <b>administration</b> <b>treats me fairly</b> because of my academic rank.	Do you worry about your <b>personal economic situation?</b>	
		I am <b>not rewarded fairly</b> [by X] for the amount of effort that I put in	Based on my <b>abilities and experiences</b> , I think I can improve my <b>economic condition</b>	Continuum from Personal Identity to Social Identity prevalent
		I feel the selection process [by X] was <b>unfair</b>	Indicate their level of <b>satisfaction with their "standard of living"</b> [self]	
		Scenario in which you imagine <b>not getting the promotion</b> you really wanted [supervisor]		
		Participants in the failure condition saw that they had scored in the 62 <sup>nd</sup> percentile on the <b>test</b> [average test result]		
		I have the opportunities to		

			<p><b>climb up the social ladder</b> and improve my socioeconomic status [society]</p> <p><b>Descending the social ladder</b> [society]</p> <p>This is to inform you that we <b>cannot offer you a position</b> with our organization</p> <p><b>Disrespect feedback</b> condition: Their suggestions are pretty useless and dumb [confederate]</p> <p><b>Dislike condition feedback:</b> the writer doesn't seem like a very nice person [confederate]</p>	
Based on: Social Identity Theory	<b>Social Identity prevalent</b> (i.e., based on categorization to/differentiation from certain groups)			
Based on: Construal-Level Theory	<i>Direct</i> confrontation with others (based on social identity)	Recurring experiences of similar, <i>direct</i> confrontations with others	No direct confrontation with others but self-comparison with others	No <i>direct</i> others but larger social context available
Examples	Social exclusion with focus on social identity (e.g., rejection by own friends)	Consequences from social exclusion (e.g., "If I want to see my friends, I am usually the one who must contact them.")	Awareness of facing stereotype threat, structural discrimination, etc.	Rise of tuition fees
Applied to Current Meta-Analysis	Cyberball game against <u>humans</u> were one includes, the other <b>excludes</b>	People make personality test and get the feedback of a life absent of meaningful <b>social connection</b> [to	Female participants compared their own <b>socio-economic status</b> relative to <u>men</u>	Measure where participants rate their <b>standing</b> on a ladder for themselves [comparison: abstract others]

Continuum from Personal Identity to Social Identity prevalent

	other people]		
Cyberball game against <u>humans</u> were both <b>exclude</b>	Composite of race and <b>work experience</b> [with <u>co-workers</u> ]	I feel resentful when I see how <b>prosperous</b> <u>other people like me</u> seem to be	Are you personally worried about your <b>job security</b> ? [ <u>labour market</u> ]
Imagine <b>exclusion</b> as Greek	In comparison with my heterosexual friends, I face <b>disapproval</b> while talking about my relationship in <u>public</u> more often	Comparing myself with <u>people in Scotland</u> , I am dissatisfied with <b>the way my life is</b> just now	The situation in the <u>labour market</u> had even worsened lately, decreasing the <b>chances for employment</b>
Imagine <b>exclusion</b> by <u>colleagues</u>	(a) how well liked the child was, (b) the extent to which he or she was <b>disliked</b> , (c) number of good friends (d) popularity among <u>peers</u> , (e) exclusion from play and activities organized by other children, and (f) the extent to which the child would or would not be chosen by peers to participate in different group activities (i.e., social, athletic, academic)	Measure where participants rate their group's <b>standing</b> on a ladder compared to <u>other groups</u> similar to themselves	The <u>government</u> <b>treats me in a fair way</b>
A kid told lies about me so that <u>other kids</u> <b>wouldn't like me</b>	Rated the degrees to which child is <b>disliked</b> by his/her <u>peers</u> and the degree to which a child does not possess adaptive social skills	In our society, some groups have a high social status and <u>some groups</u> have a <b>low social</b> status. What social status do you think you have?	Rate their <b>satisfaction</b> with these <u>institutions</u> on a 11-point scale
Abuse by the supervisor:	Teachers rate children (doesn't	In general, I do not identify with	I find the proposed

Continuum from Personal Identity to Social Identity prevalent

<p><u>puts me down in front of others</u> etc.</p>	<p>get along with <u>others</u>, gets <b>teased</b> a lot, not liked by other children)</p>	<p><u>those who</u> live a life of <b>wealth and privilege</b></p>	<p><u>government policy</u> unfair</p>
<p><b>Insulted</b> in experiment by <u>confederates</u> (face-to-face)</p>	<p><b>Rejected</b> vs popular <u>children</u> (calculated through number of most liked by classroom peers)</p>	<p>In comparison with <u>heterosexuals</u>, LGBTQ individuals <b>have to be more cautious</b> in informing about their private lives to what extent are you satisfied with this situation?</p>	<p>The <b>introduction of tuition fees</b> [by the <u>University</u>] is unfair</p>
<p>Arrive at the lab in <u>groups of 4-6</u> and instructed that the interest is to form groups in which members like and respect each other, then led to believe that <b>no one picked them</b></p>	<p>My <u>friends and family</u> support me in this (life) project</p>	<p><b>Stereotype-threat</b>: clear differences in the scores obtained by <u>men</u> and women in logical-mathematical tasks</p>	<p>The <b>(unjust) decision</b> this <u>other group</u> did, affects me now [abstract others]</p>
<p>Participants were led to believe that they were <b>picked last</b> by one of the <u>team</u> captains</p>	<p>These days, I think the <u>people in my life</u> wish they could <b>get rid of me</b></p>	<p>Do you feel that the identity of the Welsh is <b>vulnerable</b> to any extent? [<u>in comparison to other identities</u>]</p>	<p>To what extent are <u>those above you</u> <b>receptive to your ideas and suggestions</b>? [abstract others]</p>
<p>Ball gets thrown in real life and <u>participant</u> gets <b>excluded</b></p>	<p>Rate applicability: some kids have <u>classmates</u> that they can <b>become friends with</b> BUT other kids don't have classmates that they can become friends with</p>	<p>Some <u>other group</u> (rich, gender, etc.) is <b>better of</b> that us on some social dimension</p>	<p>Measure of <b>neighbourhood-level deprivation</b> [abstract others]</p>
	<p>There is always <u>someone that I can talk to</u> about my day to day</p>	<p>My country is a worthwhile country, it is <b>respected by</b></p>	<p>The <u>New Zealand political system</u> <b>operates as it should</b></p>

Continuum from Personal Identity to Social Identity prevalent

	problems	<u>others</u>	
	I have one or more <u>friends</u> to <b>confide in</b> about personal matters	Blacks are <b>economically disadvantaged</b> compared to <u>Whites</u> and Blacks are socially disadvantaged compared to Whites	Rated their dissatisfaction with the <b>social conditions</b> in New Zealand, performance of the current <u>New Zealand government</u>
	Kurds are <b>treated unfairly</b> in <u>Europe</u> The Kurdish identity is sometimes accepted in Europe Kurds in Europe are always discriminated	<u>Non-Roma</u> are unjustified to be better of in terms of <b>status/power</b> than Roma	The <u>government</u> makes sure that people of my ethnic background who are living in X <b>get what they deserve</b>
	<u>Most Non-Roma judge</u> Roma on the basis of their race/ethnicity Most Non-Roma have a problem viewing Roma as equals	Measure where participants rate their group's <b>standing</b> on a ladder compared to an <u>outgroup</u>	How much confidence do you have that the <u>department</u> will remain a <b>steady place of employment</b> for as long as you want to continue working there?
	Respondents indicated how they thought <u>others</u> would <b>react</b> to them if they had performed given behaviours that varied in social desirability	We are <b>treated unfairly</b> [ <u>in comparison to some other group</u> ]	The <b>decision</b> this <u>other group</u> did which affects us now is <b>illegitimate</b>
	<b>Ignoring</b> vs likes_ [ <u>from others</u> ] (online)	I feel frustrated and dissatisfied about the <b>amount people earn</b> in <u>Scotland</u> compared to people in England	

Continuum from Personal Identity to Social Identity prevalent

		<p><u>People</u> often <b>seek my company</b></p> <p><b>Social rejection</b> score based on the total number of liked least nominations by each child, standardized within <u>class</u></p> <p>I experience <b>discrimination</b> at the workplace (no clear reason) [<u>by co-workers</u>]</p> <p><b>Maltreatment</b> by <u>peers</u> (verbal, physical, social exclusion)</p>	<p>People in Scotland generally <b>earn less</b> than <u>people in England</u></p> <p>I feel that postwar conditions in Iraq give <u>Iraqis</u> a <b>negative impression</b> of my country</p> <p>Members of my Tai'fa are <b>unjustly kept out</b> of higher social and political positions by <u>other Tawa'if</u></p> <p>Women compared the <b>socio-economic status</b> of women relative to <u>men</u></p> <p>Our relationship to <u>X outgroup</u> is <b>unfair</b></p>		Continuum from Personal Identity to Social Identity prevalent
Based on: Construal-Level Theory	<b>Low-level construal of social context</b> (concrete others)			<b>High-level construal of social context</b> (abstract others)	
Psychological Distance	<b>Low distance</b> (self – others)			<b>High distance</b> (self – others)	
Continuum from low to high Psychological Distance: Others – Self & from low to high Construal Level of Social Context: Concrete – Abstract					

## **Appendix B**

### **Details on the Data Collection Process**

Due to the larger background upon which the current project rests, multiple people collaborated for the data acquisition. More precisely, everyone involved worked within a shared Google spreadsheet to indicate whether a given study was suitable for the larger project and if so, to fill in/code the relevant data of this source immediately after that decision. The supervisor of the current project (Max Agostini) reviewed all of the entered data according to the given criteria so that everything was screened by maximally two people independently. In case of substantial amounts of missing or unclear information, we did not include the affected study due to the limited time frame of the current project which did not allow further efforts to acquire the data (i.e., contacting the relevant authors).

## **Appendix C**

### **Non-Substantive Moderators**

In addition to the variables that were inevitable to test our hypotheses, we also coded for the following moderators because the current project was part of a larger project collaboration. For our study, these moderators were not relevant and thus, not included.

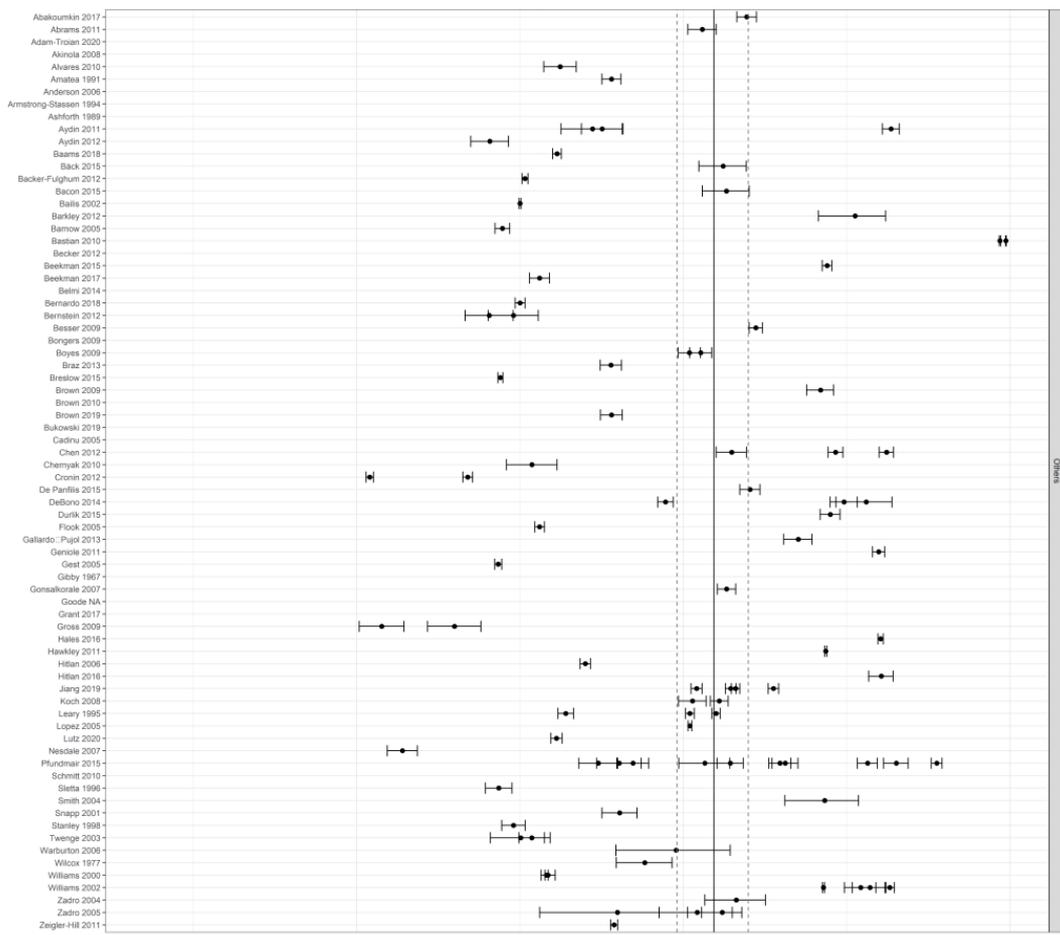
Method of retrieval (online library, snowball search or email), study design (experiment, quasi-experiment, field study, scenario, survey or, national survey), nature of control condition (neutral or inclusion), causality inference (yes or no), the time span between experience of a psychological threat and the need measurement (minutes, days, weeks, months, or years), and sample descriptives: gender composition (male, female or mix), country of origin, target group (college students, online sample, representative, face-to-face, children, citizens, or adolescents). Besides this, we recorded the mean age and size of the sample, its percentage of females and the specific label that the authors used for the construct that they measured (e.g., need to belong, belongingness need, agency, need for autonomy, etc.). In case of missing data, we made a reasonable guess, e.g., college students are usually in their 20s.

Appendix D

Forest Plots of the Current Study

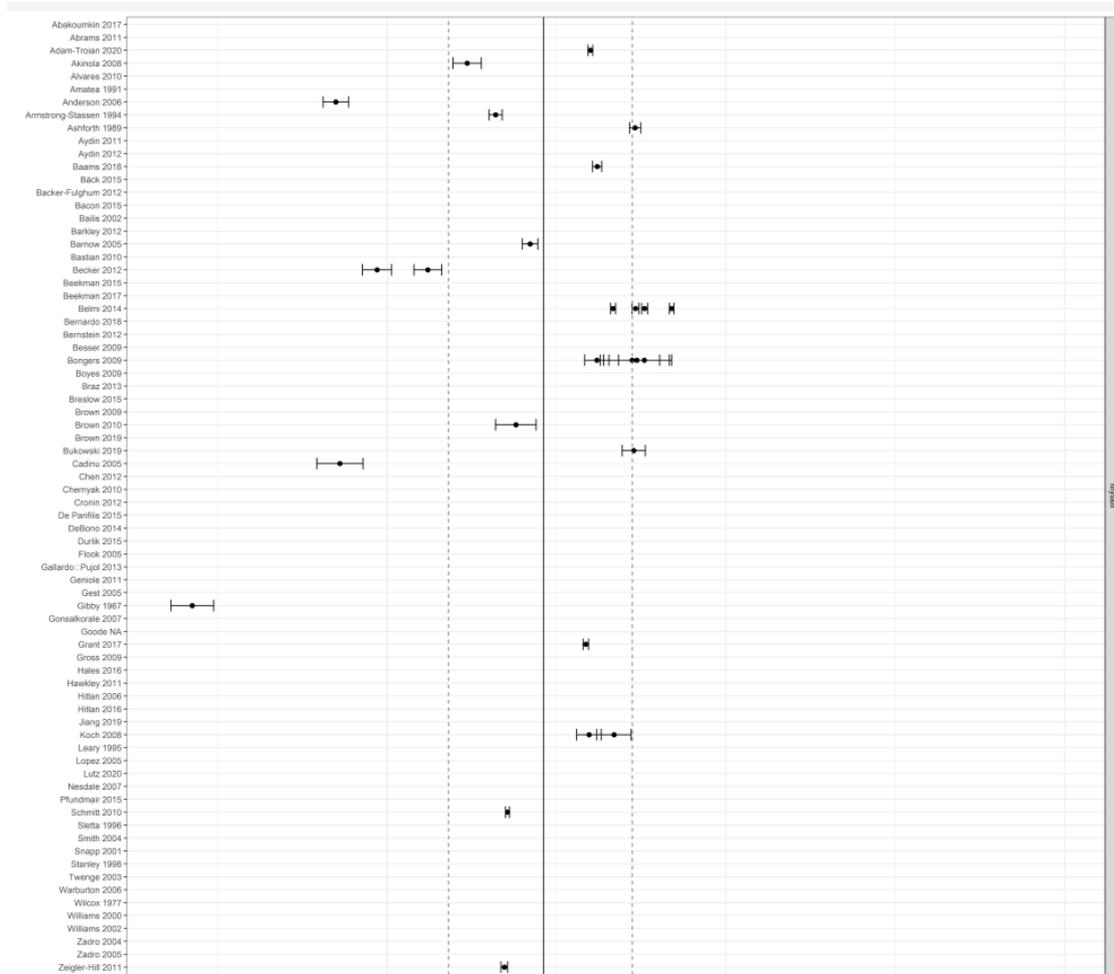
Figure A1

Forest Plot: Threat x Social Threat Category



**Figure A2**

*Forest Plot: Threat x Personal Threat Category*



**Figure A3**

*Forest Plot: Threat x Excluded Data (on the Basis of the Coding Decision)*

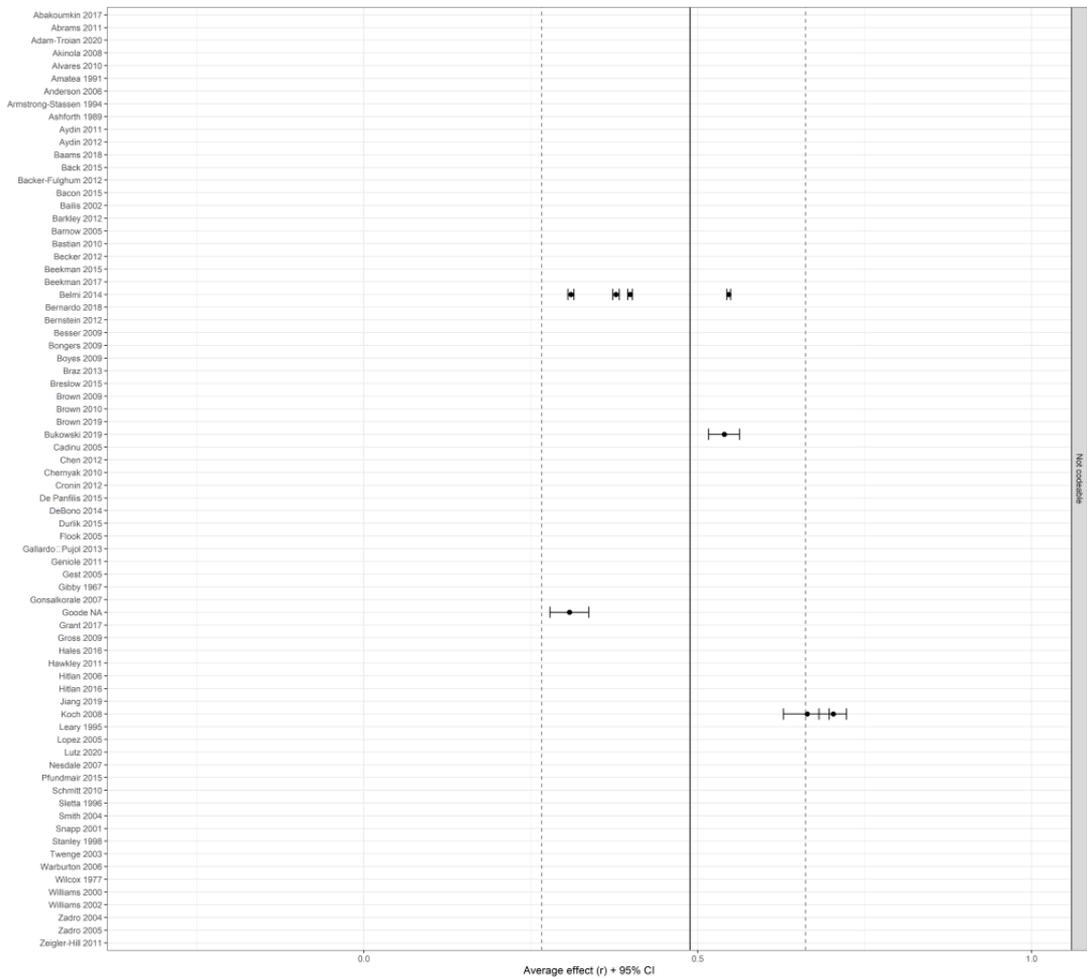
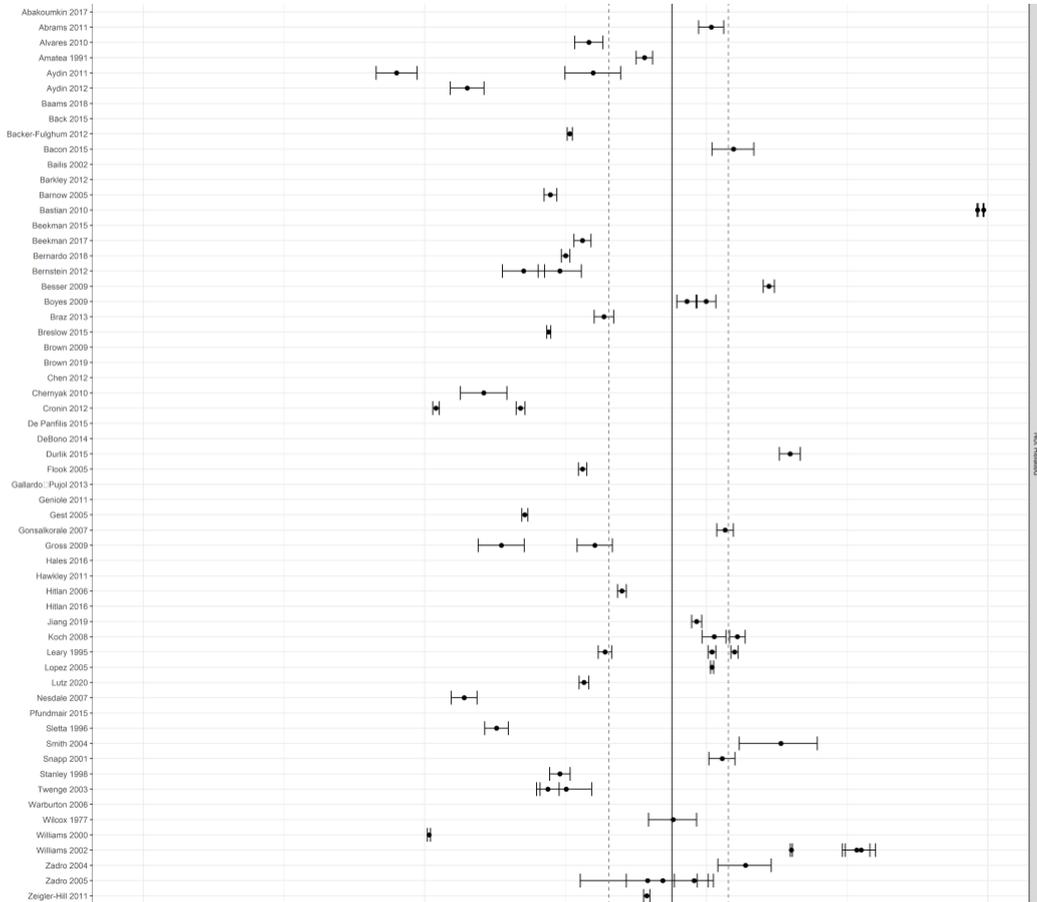


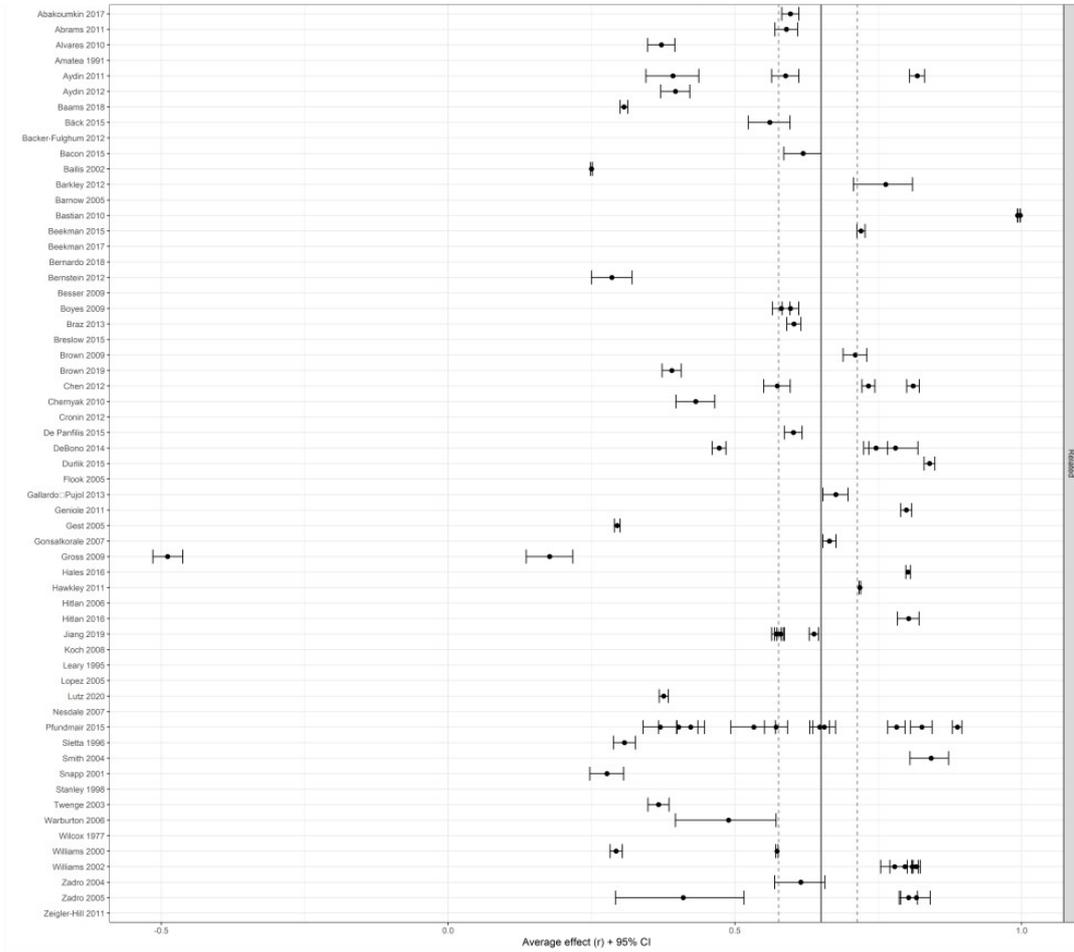
Figure A4

Forest Plot: Threat x Unrelated to Belongingness Need Dissatisfaction



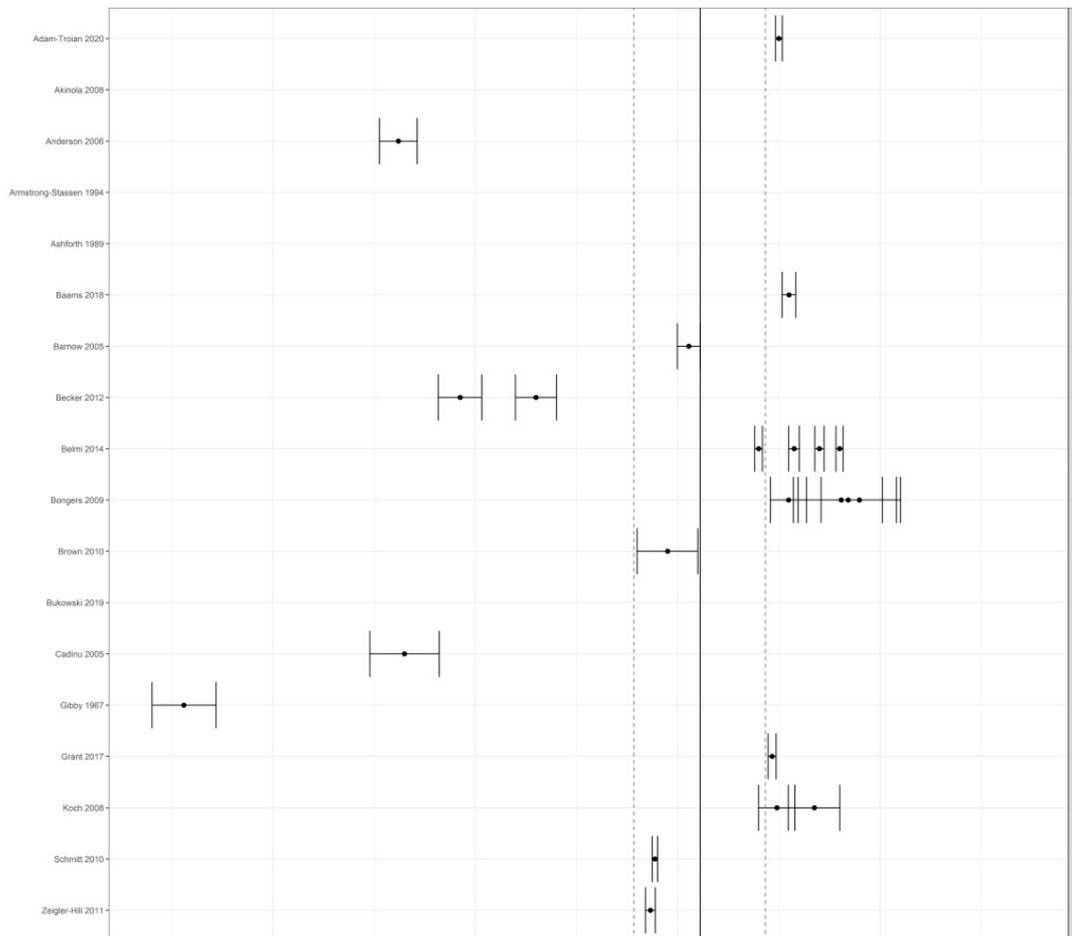
**Figure A5**

*Forest Plot: Threat x Related to Belongingness Need Dissatisfaction*



**Figure A6**

*Forest Plot: Threat x Unrelated to Autonomy Need Dissatisfaction*



**Figure A7**

*Forest Plot: Threat x Related to Autonomy Need Dissatisfaction*

