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Psychometric Properties of the Dyadic Coping Inventory: Systematic Review

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Abstract

This systematic review study analyzed the evidence of validity of the Dyadic Coping Inventory's internal structure. This instrument measures the quality of communication and the strategies of marital coping in face of the stress experienced. Stress can affect the stability and maintenance of marital relationships depending on how it is faced by the couple. The measure is a reduced version of the Dyadic Coping Questionnaire and has been applied to various cultural contexts. This research study was registered at the International Prospective Register of Systematic Reviews database. Searches for publications were made on the Capes' Portal Periódico and Google Scholar, not refining the results. Two independent researchers selected, extracted, and evaluated the data. For the validity analysis of the internal structure, the Standards for Education and psychological Testing were consulted. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement was used to summarize the review. Of the 722 studies found, 15 were selected, from the Scopus, Web of Science, John Wiley & Sons, Directory of Open Access Journals, DergiPark, Pubmed and Taylor & Francis Online databases. All articles included were quantitative, cross-sectional and peer reviewed studies, mostly carried out in Europe and in 14 different languages. Despite variations in the number of factors and items, the instrument has shown to be stable and invariant across genders and cultures. These results suggested a reliable score to measure Dyadic Coping. This review can contribute to clinical practice and research in marital and family relationships.

Keywords

systematic review, dyadic coping inventory, psychometrics

Dyadic Coping (DC) is a construct derived from Individual Coping that is based on one of the approaches of the systemic perspective, the Transactional Model. This model understands stress as a result of insufficient personal resources to deal with an aversive context. To deal with the negative effects of stress, cognitive styles and/or strategies are developed to face the event, aiming at emotional regulation to overcome the problem. Coping is understood as the efforts employed to manage stress (Lazarus & Folkman, 1984).

According to Story and Bradbury (2004), the analysis of Individual Coping may not be enough to deal with broader contexts, such as the marital one. Carr et al. (2014) highlighted that even when stress initially affects one member of the couple, its effects could have repercussions on both. Therefore, the emotional state of one would influence the emotional state of the other and bring implications to the stress level of the couple (Buchanan et al., 2012).

Bodenmann (1997) expanded Lazarus and Folkman (1984) individual Systemic Transition Model (STM) to the context of couples. Briefly, the STM for couples requires a few evaluative and coping steps: 1) one or both partners interpret a potential stressor and compare them with their resources and capacities (personal or environment); 2) if the stressor is understood as bigger than the resources that person has, the stress experience occurs and both verbal and non-verbal responses are issued to the partner; 3) from this communication and the interpretation of the stress, coping strategies are created for the stressed partner. In case the stress is perceived simultaneously by both partners either the dyadic strategy for coping or mutual support occurs.

To deal with stressful situations, the couple's members would develop interactional forms of coping, the Dyadic Coping. DC can either be positive or negative in nature (Bodenmann, 2005). According to the Systemic Transactional Model, the positive responses are: The Supportive Dyadic Coping (SDC), which occurs when one of the partners seeks to help the other to deal with some difficult situation, for example, by providing support and advice; the Common Dyadic Coping (CDC) which refers to a proportionality of engagement in actions among the members of the dyad to overcome an adversity; Delegated Dyadic Coping (DDC) which is the way in which one of the partners, upon the request for help of the other, takes on tasks/responsibilities to reduce the stress of their partner (Bodenmann et al., 2011).

Negative Dyadic Coping (NDC) strategies include the Hostile Negative Dyadic Coping, understood as aid accompanied by hostility and/or belittling of the partner; Ambivalent Negative Dyadic Coping, expressed by unwillingly help to the partner and/or from the perspective of personal gain; and Superficial Negative Dyadic Coping, when the support provided by the partner is not sincere or empathetic (Bodenmann & Randall, 2012). For Pires (2011), when Coping occurs through positive strategies, there are higher rates of couple's well-being and health, with features such as stability and longevity of

the relationship. NDC strategies, on the other hand, favor the emergence of new conflicts or aggravation of existing ones and shorten the relationship.

From the Systematic-Transactional perspective, the Fragebogen zur Erfassung des Dyadischen Copings als Tendenz (FDCT-N; Dyadic Coping Questionnaire) was developed to assess the marital patterns of Coping (Bodenmann, 1997, 2000). It consists of 68 items with a five-point scale, which measure the quality of communication, their own behavior and that of the partner in view of each other's perception of stress and the joint coping with the stressful situation. FDCT-N had two items related to the assessment of a person's Coping and that of the partner (Bodenmann et al., 2018).

After FDCT-N, Bodenmann (2008) developed a reduced version of this instrument, the Dyadic Coping Inventory (DCI). It is a self-report instrument that assesses the quality of communication and Dyadic Coping behaviors that occur in an intimate relationship when one or both partners are stressed. It is composed of three scales that refer to the respondent's perspectives, Oneself (self-perception), Partner (partner's perception) and Common (couple's perception). The Oneself and Partner items and factors are similar, but modified to suit these different perspectives. In these scales, the following factors are found: Stress Communication, how I evaluate my own communication of stress (Oneself) and that of my partner (Partner); SDC, how I support my partner (Oneself) and how my partner supports me (Partner); DDC, how I incorporate my partner's tasks and assignments to reduce their stress (Oneself) and how my partner does it for me (partner); NDC, how hostile, insincere and willing I am to my partner when I go to help him (Oneself) and how my partner acts that way towards me (Partner). Finally, the Common Scale refers to the respondent's perception of the way he and his partner deal with stress together.

Since then, 15 studies of the DCI psychometric properties were carried out in several countries (Ekimchik & Kryukova, 2017; Falconier et al., 2013; Fallahchai et al., 2019; Gmelch et al., 2008; Kanth et al., 2022; Kurt & Akbaş, 2019; Ledermann et al., 2010; Levesque et al., 2014; Martos et al., 2012; Randall et al., 2016; Rusu et al., 2016; Shujja et al., 2020; Vedes et al., 2013; Wendołowska et al., 2020; Xu et al., 2016).

For the Standards for Educational and Psychological Testing, validity has a unique concept, which refers to the degree to which evidence support the interpretation of test scores. Accumulation of validity evidence reveals the justifiable condition for the use of a given score. There are four sources of validity evidence: content, internal structure, response process, relation to variables from other constructs and consequences of testing (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014).

This systematic review searched the literature for studies published on psychometric properties of the Dyadic Coping Inventory. This research study aims to contribute to clinical practice and research in marital and family relationships. It is an instrument empirically capable of detecting changes in the Dyadic Coping patterns, allowing clini-

cians to track the progress of the psychotherapeutic interventions using the DCI as one of the tracking indicators (Gmelch et al., 2008). For relationship researchers it provides evidences of the construct across different cultures and genders (Wendołowska et al., 2020).

Method

Systematic review is a scientific investigation that uses explicit and systematic methods with eligibility criteria to answer a given research question. For this purpose, it is necessary to have search methods, study selection criteria, methods for data extraction, analysis and synthesis, results, discussions, and final considerations. It is recommended that the review should have a protocol and be performed by a team working independently (Higgins et al., 2021). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist (Page et al., 2021) was used to guide the writing of this report.

Protocol and Registration

The systematic literature review was registered in the international Prospective Register of Systematic Reviews (PROSPERO) database, ID CRD42021232506. The review used data from primary studies of the psychometric properties of the Dyadic Coping Inventory (DCI).

Eligibility Criteria

Studies published in peer-reviewed journals that reported adaptation procedures and evidence of validity of the DCI instrument were included.

Sources of Information and Search Strategies

Data searches were performed on the platform *Portal Periódico* of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (Coordination for the Improvement of Higher Education Personnel – Capes), *biblioteca virtual* (virtual library), and on the search engine Google Scholar to answer the research question: "What evidence of validity of the Dyadic Coping Inventory has been presented in the published adaptations of the instrument?"

Capes' *Portal Periódico* has restricted access to its content. Access is made through the *Comunidade Acadêmica Federada* (Federated Academic Community – CAFe), which provides indexed works via searches by subject, journals, books, and international and national databases. The search by subject was performed, and several descriptors in English were tested with the Boolean operators "AND" and "OR". The term "Dyadic Coping Inventory" was combined with psychometric properties, adaptation, validation,

instrument, tools, scale, questionnaire. However, the term "dyadic coping inventory" alone presented the highest number of results.

Due to the integrating character of the portal, the filters were not applied in searches such as publication date, language, database, journals, and books. This allowed the simultaneous consultation in the portal's collections. From the beginning to the end of the search process, no new material within the scope of the question was identified on the portal. However, the search has been saved and the alert has been activated for new publications.

At the stage of thorough reading of the studies, in the references of one of them it was found an adaptation of the instrument that was not indexed in the portal's database. As a result, a paired data search process was carried out using the same descriptor "Dyadic Coping Inventory" on Google Scholar search engine, with no filters. Data searches were performed in February 2021 and the last update occurred in August 2021.

Selection of Studies

The studies were selected according to the titles and abstracts by two independent reviewers, and in cases of disagreement, a third researcher was consulted for consensus. The records found were exported to Zotero, a reference manager software, and a computer program was used for data tabulation. Due to the identification of errors in the detection of duplicate items in Zotero, the data was exported to the program. After data export, the following procedures were performed: exclusion of duplicate records, reading of titles and abstracts, exclusion of materials that were not in accordance with the inclusion criterion regarding the description of the evidence of validity procedures of the Dyadic Coping Inventory instrument. The works within the criterion were fully read.

For full reading of studies in German, Turkish, Hungarian, and Russian languages, they have been translated into English-Portuguese and reversed to the original language to minimize translation errors. The translation was done with the help of a free online resource.

Data Analysis and Extraction

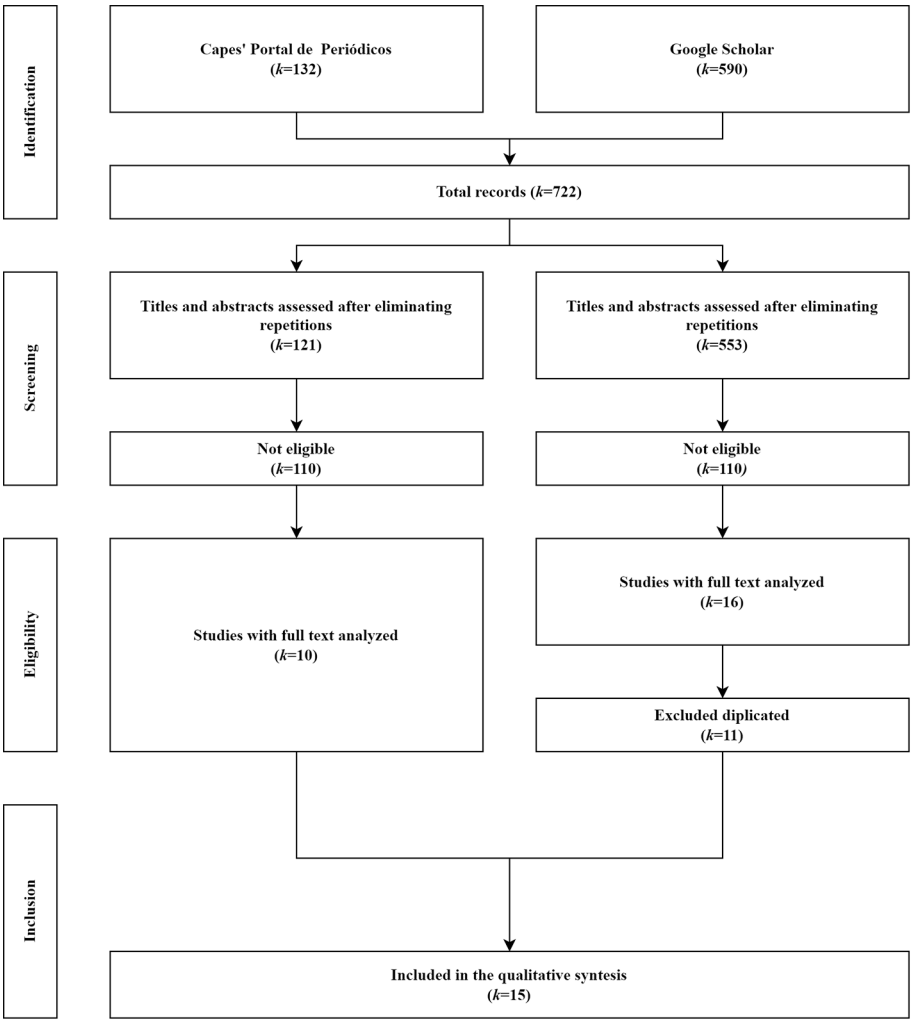
The data analysis and extraction were performed by three researchers. Two of them extracted the data and another one worked as reviewer and specialist in case of doubts about the analysis and extraction of data from the studies. From the studies accepted for full reading, the following information was collected: search tool, database, author, year of publication, language, sample characteristics (age range, location/country of origin), type of study, journal characteristics (title, Impact Factor, H Index, *Qualis Capes*), factor retention analysis, reliability, and invariance. The step of extracting validity from the internal structure of the score was performed according to the Standards for Educational and Psychological Testing (AERA, APA, & NCME, 2014).

Results

A total of 722 records were found in Capes' *Portal Periódico* and on the Google Scholar Platform. After excluding duplicate materials on each platform and overlapping between the platforms, and after the application of the inclusion criteria, 10 studies from the portal and four from Google Scholar were included. After the last search update, another eligible study was found on Google Scholar, totaling 15 studies (Figure 1). Full access to this latest study was via *Portal*.

Figure 1

Flowchart With the Steps of the Selection of the Systematic Review Studies



Portal provides a list of versions (repeated material) of publication of studies in each database. The accepted publications were counted only once, and the databases considered in order of results. After the exclusion of the repetitions, of the 15 databases, two were considered: Web of Science and Scopus, with 10 studies. In Google Scholar, four more databases were included, Directory of Open Access Journals (DOAJ), with two studies, DergiPark, Pubmed and Taylor and Francis Online, with three.

The studies are quantitative, cross-sectional, and empirical, except for Gmelch et al. (2008), and reviewed by peers, except for a journal (*Psychiatry Hungarica*) in which the information is not displayed. The publications were written in English except for Ekimchik and Kryukova (2017), Gmelch et al. (2008), Kurt and Akbaş (2019), and Martos et al. (2012). Only Falconier et al. (2013) informed the year of the research study: 2009. Five studies reported heterosexual orientation (Falconier et al., 2013; Gmelch et al., 2008; Levesque et al., 2014; Wendołowska et al., 2020; Xu et al., 2016).

In relation to the types of relationships, participants from 14 studies declared that they were living with their partner or in a committed relationship, married, in cohabitation, in a close relationship and relationship with partner. Levesque et al. (2014) have not specified their relationship.

Table 1 shows the characteristics of the 15 eligible studies. The journal *Psychological Assessment* had a higher impact factor, H index and better Qualis Capes. The access to the Journal Citation Reports database was through the Portal. Research on evidence of DCI validation was carried out in the continents of Europe, Asia, and America, mostly in Europe. The original German version of the DCI (Bodenmann, 2008) has been translated and adapted into 14 languages, English (Levesque et al., 2014; Randall et al., 2016), French and Italian (Ledermann et al., 2010), Hungarian (Martos et al., 2012), Spanish (Falconier et al., 2013), Portuguese – Portugal (Vedes et al., 2013), Romanian (Rusu et al., 2016), Chinese (Xu et al., 2016), Russian (Ekimchik & Kryukova, 2017), Persian (Fallahchai et al., 2019), Turkish (Kurt & Akbaş, 2019), Urdu (Shujja et al., 2020), Polish (Wendołowska et al., 2020), Tamil (Kanth et al., 2022). The German version by Gmelch et al. (2008) and Ledermann et al. (2010) were a validation study.

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Table 1

Characteristics of Included Studies

Journals (k = 13)			Studies (k = 16)								
				Sample				Internal Validity			
Impact Factor[a]	H-Index[b]	Qualis Capes[c]	Authors	Country	n (age)	Relationship (duration)	Language	Analysis	Factors	Items	Removed items
Z.Familienforsch (ISSN 1437-2940)											
0.406	12	—	Gmelch et al. (2008)	Switzerland	2,399 persons (≥ 18 years)	12 years	German	PCA	4 + 4 + 1	39	
Swiss J. Psychol. (ISSN 1421-0185)											
0.929	31	—	Ledermann et al. (2010)	Switzerland and Italy	792 individuals groups (M, SD years): German (28.7, 11.6), Italian (36.8, 13.3), French (33.7,14.4)	Groups (M, SD years): German (6.32, 8.4), Italian (14.6, 12.3), French (14.6, 12.3)	German, Italian, French	CFA	4 + 4 + 1	37 /35[d]	2 (2, 17)[e]
Psychiatria Hungarica (ISSN 0237-7896)											
—	12	—	Martos et al. (2012)	Hungary	473 individuals (M_{age} = 34.01, SD = 1.90)	M = 10.4, SD = 11.0	Hungarian	PCA	4 + 4 + 1	37	
Anxiety stress Coping (ISSN 1061-5806)											
2.887	67	—	Falconier et al. (2013)	United States	113 couples (≥ 18 years)	≥ 1 year	Spanish	CFA	5 + 5 + 2	31	6 (2, 3, 15, 17, 18, 26)
Swiss J. Psychol. (ISSN 1421-0185)											
0.929	31	—	Vedes et al. (2013)	Portugal	605 individuals (≥ 18 years)	≥ 2 years	English	CFA	5 + 5 + 2	37	
Meas. Eval. Couns. Dev. (ISSN 0748-1756)											
1.512	47	—	Levesque et al. (2014)	Canada	709 couples (≥ 17 years)	≥ 1 month	English	CFA	5 + 2	30	7 (2, 3, 8, 17, 18, 23, 35)
			Randall et al. (2016)	United States	938 individuals (≥ 18 years)	≥ 2 years	English	CFA	5 + 5 + 2	31	6 (2, 3, 9, 17, 18, 24)
Meas. Eval. Couns. Dev. (ISSN 0748-1756)											
1.512	47	—	Rusu et al. (2016)	Romania	510 couples (≥ 19 years)	≥ 0.3–39 years	Romanian	CFA	5 + 5 + 2	31	6 (2, 3, 9 17, 18, 24)

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Journals (k = 13)			Studies (k = 16)								
				Sample				Internal Validity			
Impact Factor[a]	H-Index[b]	Qualis Capes[c]	Authors	Country	n (age)	Relationship (duration)	Language	Analysis	Factors	Items	Removed items
Psychol. Assess. (ISSN 1040-3590)											
5.123	140	A2	Xu et al. (2016)	China	474 couples (≥ 18 years)	M = 9.4, SD = 7.9 years	Chinese	CFA	5 + 5 + 2	33	4 (2, 3,17, 18)
Psychological Studies (ISSN 2075-7999)											
—	—	—	Ekimchik & Kryukova (2017)	Russia	165 couples (≥ 18 years)	≥ 6 months	Russian	CFA	4 + 4 + 1	37	
Cure. Psychol. (ISSN 1046-1310)											
4.297	41	B2	Fallahchai et al. (2019)	Iran	408 couples (M = 31.3, SD = 8.68)	M = 9.50, SD = 9.18 years	Persian	EFA, PCA, CFA	5 + 5 + 1	37	
OPUS- Inter. J. Society Researches (ISSN 2528-9527)											
—	—	—	Kurt & Akbaş (2019)	Turkey	720 individuals	≥ 1 year	Turkish	CFA	5 + 5 + 2	37	
Interpersona (ISSN 1981-6472)											
—	5	B3	Shujja et al. (2020)	Pakistan	538 adults (≥ 18 years)	≥ 2 years	Urdu	CFA	5 + 5 + 2	33	4 (2, 3, 17, 18)
			Wendołowska et al. (2020)	Poland	275 couples (≥ 20 years)	≥ 1 year	Polish	CFA	5 + 5 + 2	31	6 (2, 3, 15, 17, 18, 26)
Marriage Fam. REV (ISSN 0149-4929)											
—	39	B1	Kanth et al. (2022)	India	931 individuals (≥ 20 years)	≥ 2 years	Tamil	CFA	5 + 5 + 2	31	6 (2, 3, 7, 17, 18, 22)

Note. — = Does not apply to this study. PCA = Principal Component Analysis; CFA = Confirmatory Factorial Analysis; EFA = Exploratory Factor Analysis.
[a]2020 Journal Impact Factor, Journal Citation Reports (Clarivate Analytics, 2021).
[b]2020 Scimago Journal and Country Rank (SCImago, 2021).
[c]Capes's Sucupira Platform in Brazil (period 2013-2016; CAPES, 2016).
[d]37 items in German and 35 in French and Italian.
[e]The works in French and Italian were excluded.

Factors of the DCI

The DCI is a psychometric instrument composed of 37 items scored on a five-point Likert scale, which, through the participants' perceptions of their amorous relationships, aims to measure the quality of communication and the Dyadic Coping of the couple under stress. In the factors Stress Communication (SC, eight items), Suportive Dyadic Coping (SDC, 10 items), Delegated Dyadic Coping (DDC, four items) and Negative Dyadic Coping (NDC, eight items), the participant will point out how they perceive themself and their partner, while in the Common Dyadic Coping (CDC, five items), how the couple deals with stress together, e.g., "We try to cope with the problem together and search for ascertained solutions." (Bodenmann et al., 2018).

The SC, SDC, DDC and NDC factors are inserted in three independent scales: Oneself, Partner and Common. Oneself measures how the respondent assesses their communication of stress and provides partner support. Partner assesses how the respondent perceives the partner's stress communication and support. The Common Scale measures how the respondent assesses the way they cope with stress together (Bodenmann et al., 2018).

Thus, Stress Communication Oneself (SCO), for example, "I let my partner know that I appreciate his/her practical support, advice, or help", and Stress Communication Partner (SCP), "My partner lets me know that he/she appreciates my practical support, advice, or help". Supportive Dyadic Coping Oneself (SDCO), "I express to my partner that I am on his/her side", Supportive Dyadic Coping Partner (SDCP), "My partner expresses that he/she is on my side". Delegated Dyadic Coping Oneself (DDCO), "I take on things that my partner would normally do in order to help him/her out", Delegated Dyadic Coping Partner (DDCP), "My partner takes on things that I normally do in order to help me out". Negative Dyadic Coping Oneself (NDCO), "I blame my partner for not coping well enough with stress", Negative Dyadic Coping Partner (NDCP), "My partner blames me for not coping well enough with stress" (Bodenmann et al., 2018).

The instrument also presents the Evaluation Dyadic Coping (EDC), which by means of two items, measures the satisfaction of the respondent with the Dyadic Coping of the couple. In addition, it measures the Total DC, which is calculated based on the sum of the scores (below average; dyadic coping in the normal range; above average) of the respondent (Bodenmann et al., 2018).

In the first empirical study of DCI, Gmelch et al. (2008) found the structure of nine factors, they are: SC refers to the communication of stress; SDC refers to spontaneous support to the stressed out partner; DDC alludes to the stressed partner's assumption of tasks upon request, in order to reduce their stress load; NDC is also a way of providing support. However, in a hostile, involuntary or superficial way. Finally, the CDC refers to the joint and relatively symmetrical efforts that the couple makes when the stressor is mutual (Bodenmann et al., 2018).

In this research, a procedure was adopted to present the structured of DCI versions. For economy purposes, the factor structure will be presented by three numbers related to the number of factors for each scale, Oneself, Partner and Common, respectively. For example: 4 + 4 + 1 means four factors for Oneself, four for Partner and one for Common. This structure was found in Gmelch et al. (2008), Ekimchik and Kryukova (2017), Ledermann et al. (2010) and Martos et al. (2012).

Three techniques for factor retention were identified, Principal Components Analysis (PCA), Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The EFAs and PCAs aim to reduce the data, however, in PCAs there are no distinction between Common Variation and Specific Variation, which does not occur in the EFAs. PCAs tend to overestimate the number of factors (which in this technique are called components), therefore, their results are imprecise and not recommended in Psychology studies. Confirmatory Factor Analysis seeks to test a theoretically existing structure (Damásio, 2012). According to Silva et al. (2015), this analysis is more adequate in studies that are looking for evidence of psychological instrument's validity.

Most studies used to test the 4 + 4 + 1 or 5 + 5 + 2 (Table 1). PCA was used to test the original DCI structure (Bodenmann et al., 2018) and retained only the individual factors (SC, SDC, DDC and NDC) for Oneself and Partner (Fallahchai et al., 2019; Martos et al., 2012). Additionally, Fallahchai et al. (2019) found the same individual factors through PCA and obtained better fits for the 5 + 5 + 2 structure through a CFA. Wendołowska et al. (2020) reported the use of EFA, but in their results they only discussed CFA.

Despite what Levesque et al. (2014) reported, that the factorial solution found in his study corroborated the structure of the original DCI, the DCI structure was presented in a different way. The author did not separate the factors (SC, SDC, DDC, NDC and CDC) in the Oneself, Partner and Common scales, instead he called them Dyadic Coping Factors and the scales (Oneself and Partner) Target Factors. Therefore, the structure was classified as 5 + 2 (five DC factors and two Target Factors) in Table 1.

In Table 1, Falconier et al. (2013), Fallahchai et al. (2019), Kanth et al. (2022), Kurt and Akbaş (2019), Randall et al. (2016), Rusu et al. (2016), Shujja et al. (2020), Vedes et al. (2013), Wendołowska et al. (2020) and Xu et al. (2016) presented a 5 + 5 + 2 structure. The SDC and CDC factors were subdivided in two new factors, Problem-Focused and Emotion-Focused. The Problem-Focused refers to help through practical advice and actions, focusing on stress-triggering problems. The Emotion-Focused considers the emotional support and demonstration of empathy, that corroborate Bodenmann's theoretical formulations (Bodenmann, 1995).

Therefore, the SDC contains Problem-Focused Dyadic Coping (PSDC) oriented to the Oneself scale (PSDCO), e.g. "I tell my partner that his/her stress is not that bad and help him/her to see the situation in a different light" and to the Partner Scale (PSDCP), e.g. "My partner helps me to see stressful situations in a different light". Additionally, Emotion-Focused Supportive Dyadic Coping (ESDC) to the Oneself scale (ESDCO), e.g. "I

show empathy and understanding to my partner" and to the Partner scale (ESDCP), e.g. "My partner shows empathy and understanding to me". For the CDC, Problem-Focused Common Dyadic Coping (PCDC), e.g. "We help one another to put the problem in perspective and see it in a new light", and Emotion-Focused Dyadic Coping (ECDC), e.g. "We are affectionate to each other, make love and try that way to cope with stress" (Falconier et al., 2013; Kanth et al., 2022; Kurt & Akbaş, 2019; Randall et al., 2016; Rusu et al., 2016; Shujja et al., 2020; Vedes et al., 2013; Wendołowska et al., 2020; Xu et al., 2016). Kurt and Akbaş (2019), Levesque et al. (2014), and Xu et al. (2016) did not include the EDC factor.

Falconier et al. (2013), Levesque et al. (2014), Randall et al. (2016), Rusu et al. (2016), Xu et al. (2016), Shujja et al. (2020), Wendołowska et al. (2020), Kanth et al. (2022) and Ledermann et al. (2010) presented items exclusions, as shown in Table 1. The exclusions were due to low factor loading, crossloading or to maintain the balance in the number of items between the Oneself and the Partner scales. The SC factors of the Oneself and Partner scales demonstrates a higher number of excluded items between the studies, specifically due to the items, 2 "I ask my partner to do things for me when I have to much to do", 3 "I show my partner through my behavior when I am not doing well or when I have problems", 17 "My partner ask me to do things for him/her when he has too much to do", and 18 "My partner shows me through his/her behavior that he/she is not doing well or when he/she has problems".

Regarding the NDC (Oneself and Partner) factors, a less frequent and regular pattern of excluded items were found. Falconier et al. (2013) and Wendołowska et al. (2020) excluded the items 15 "When I am stressed, my partner tends to withdraw" and 26 "When my partner is stressed I tend to withdraw". Kanth et al. (2022) excluded the items 7 "My partner blames me for not coping well enough with stress" and 22 "I blame my partner for not coping well enough with stress".

In the ESDC (Oneself and Partner), Randall et al. (2016) and Rusu et al. (2016) excluded the items "My partner listens to me and gives me the opportunity to communicate what really bothers me" and 24 "I listen to my partner and give him/her space and time to communicate what really bothers him/her". Levesque et al. (2014) excluded a couple of items of the SDC scale, numbers 8 "My partner helps me to see stressful situations in a different light", 23 "I tell my partner that his/her stress is not that bad and help him/her to see the situation in a different light", and 35 "We are affectionate to each other, make love and try that way to cope with stress" of the CDC factor.

Differences Between Groups Among Studies

As shown in Table 2, no significant differences were found ($p < .05$) between men and women to the ESDCP, PSDCO, and ECDC factors. The most common variation between the genders was in Stress Communication (SC) patterns. There are differences between the Stress Communication Oneself (SCO) and Partner (SCP) factors in eight of

the studies. In six of them, women had higher scores in SCO and, in seven, lower in SCP. The women perceive themselves as more emotionally supportive (ESDC) in relation to their partners, as well as evaluating the solutions developed by the couple as more problem-solving oriented (PCDC) compared to men. Finally, men agreed with women that they are less engaged in Total Dyadic Coping (Total DC) behaviors than their partner.

In addition to differences in factor scores, according to Table 3, Shujja et al. (2020) studied gender invariances. Kanth et al. (2022) and Ledermann et al. (2010) studied invariances across cultures. Randall et al. (2016), Xu et al. (2016) and Wendołowska et al. (2020) between both.

Table 2

Significative Scores Differences Between Groups

	Groups Compared		
Authors	**Gender**	**Culture**	**Results**
Gmelch et al. (2008)	X	—	No differences in SC or DC, but report that W > Reliability on Retest.
Ledermann et al. (2010)	—	X	Germany > NDCO**, DDCO**, EDC***; Italian > SCP*.
Martos et al. (2012)	X	—	M > SCO***, SDCO***, DDCO***, SCP***, CDC***, Total PDC***, DCO***, Total DC***; W > SDCP***, NDCO***, DDCP***, NDCP***, EDC***, DCP***, Total NDC***.
Falconier et al. (2013)	X	—	H > SCP[a], PSDCP[a], Total DCP[a], EDC[a]; W > DDCO[a], Total DCO[a].
Vedes et al. (2013)	X	—	W > SCO[a], DDCO[a], NDCO[a].
Levesque et al. (2014)	—	—	—
Randall et al. (2016)	X	X	M > SCP, NDCP; W > SCO, ESDCO, DDCO, PCDC, Total DCO, Total DC.
Rusu et al. (2016)	X	X	M > SCP**, EDC**, Total DCP**; W > SCO**, ESDCO**, PCDC*, Total DCO.
Xu et al. (2016)	X	X	Genders between Chineses couples: M > SCO*; W > SCP*. Between cultures: Chineses couples: < ESDC*, PSDC*, DDC*, CDC*; > NDC* in comparison to the Swiss or North American couples.
Ekimchik & Kryukova (2017)	X	—	M > DDCO*, SCP***; W > SCO***.
Fallahchai et al. (2019)	—	—	—
Kurt & Akbaş (2019)	—	—	—

	Groups Compared		
Authors	**Gender**	**Culture**	**Results**
Shujja et al. (2020)	X	—	M > SCP*, DDCP*; W > SCO*, DDCO*.
Wendołowska et al. (2020)[b]	X	X	M > SCP, DDCO; W > SCO, DDCP.
Kanth et al. (2022)	X	X	M > SCP**; W > NDCP**.

Note. M = Men; W = Women; SC = Stress Communication; DC = Dyadic Coping; NDCP = Negative Dyadic Coping Partner; SCP = Stress Communication Partner; SCO = Stress Communication Oneself; DDCP = Delegated Dyadic Coping Partner; DDCO = Delegated Dyadic Coping Oneself; ESDC = Emotion-Focused Suportive Dyadic Coping; PSDC = Problem-Focused Suportive Dyadic Coping; DDC = Delegated Dyadic Coping; CDC = Common Dyadic Coping; NDCO = Negative Dyadic Coping Oneself; EDC = Evaluation Dyadic Coping; PDC = Positive Dyadic Coping; PCDC = Problem Common Dyadic Coping. DCO = Dyadic Coping Oneself; DCP = Dyadic Coping Partner; Total PDC = Total Positive Dyadic Coping; Total PDC = Total Positive Dyadic Coping; Total NDC = Total Negative Dyadic Coping.
[a]Do not show significance level.
[b]Do not show mean among culture.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3

Invariances Between Groups Among Studies

	Gender			Culture		
Authors	**Configural**	**Metric**	**Scale**	**Configural**	**Metric**	**Scale**
Gmelch et al. (2008)						
Ledermann et al. (2010)				*		
Martos et al. (2012)						
Falconier et al. (2013)						
Vedes et al. (2013)						
Levesque et al. (2014)						
Randall et al. (2016)	**	**	**	**	**	*
Rusu et al. (2016)	**	**	**	**	**	*
Xu et al. (2016)	**	**	**	**	**	*
Ekimchik and Kryukova (2017)						
Fallahchai et al. (2019)						
Kurt and Akbaş (2019)						
Shujja et al. (2020)	**	**	**			
Wendołowska et al. (2020)	**	**	**	**	**	*
Kanth et al. (2022)				**	**	*

Note. * = Partial invariance level reached; ** = Full invariance level reached.

Studies of invariance by means of the Multi-Group Confirmatory Factor Analysis (MGCFA) verify whether two or more groups of a study differ from each other and how much they vary, based on the responses to the items of a psychometric instrument. There are four hierarchical and additive forms of measurement invariance: configural invariance (equal model structures), metric invariance (equal factor loadings), scalar invariance (equal intercepts), and residual invariance, equal residues (Putnick & Bornstein, 2016). When a level of invariance is not fully reached, it is specified that a partial invariance has been found. In exception to Ledermann et al. (2010) study, that only reached configurational level between the two out of the three compared groups, all the others reached scalar invariance between genders and partial scalar invariance between cultures.

Reliability

As for the original instrument, the internal consistency of the subscales ranged from α = .71 to α = .92. The lowest reliability of the retest, which happened after two weeks, was between .52 and .80. This indicates that DCI is sensitive to temporal changes (Bodenmann et al., 2018). Most of the Reliability topic information has been entered in Table 4.

Table 4

Coefficient of Reliability of the Studies

	Cronbach's Alpha α			
Authors/Sample	**DCI Total**	**Range**		**< .60**
Gmelch et al. (2008)				
M	.92	.71 (NDCP)	.89 (EDC)	—
W	.93	.72 (NDCO)	.92 (EDC)	—
Randall et al. (2016)				
M	.95	.54 (PSDCO)	.94 (EDC)	.54 (PSDCO)
W	.94	.45 (PSDCO)	.95 (EDC)	.45 (PSDCO)
Rusu et al. (2016)				
M	.93	.52 (PSDCO)	.92 (EDC)	.52 (PSDCO)
W	.93	.51 (PSDCO, ECDC)	.94 (EDC)	.51 (PSDCO, ECDC)
Kurt and Akbaş (2019)				
M, W	—	.63 (NDCO)	.87 (ESDCP)	—
Martos et al. (2012)				
M, W	.92	.67 (SCO)	.92 (EDC)	—

	Cronbach's Alpha α			
Authors/Sample	**DCI Total**	**Range**		**< .60**
Xu et al. (2016)				
M	—	.51 (PSDCO)	.80 (ECDC)	.51 (PSDCO)
W	—	.52 (DDCP)	.78 (SCO)	.52 (DDCP)
Ekimchik and Kryukova (2017)				
M, W	.82	.55 (SCP)	.91 (EDC)	.55 (SCP)
Vedes et al. (2013)				
M	.94	.64 (SCO)	.97 (EDC)	—
W	.95	.63 (PSDCO)	.97 (EDC)	—
Fallahchai et al. (2019)				
M, W		.64 and .66 (NDC)	.81[a]	—
Ledermann et al. (2010)				
German	.91	.61(NDCO)	.86 (DDCO)	—
Italian	.90	.62 (NDCO)	.90 (EDC)	—
French	.90	.50 (NDCP)	.92 (EDC)	.50 (NDCP); .53 (NDCO)
Wendołowska et al. (2020)				
M, W	.86	.57 (SCO)	.90 (EDC)	.57 (SCO)
Levesque et al. (2014)				
M, W	—	.69[a]	.81[a]	—
Falconier et al. (2013)				
M	.94	.64 (NDCO)	.95 (PCDC)	—
W	.94	.55 (PSDC)	.94 (EDC)	.55 (PSDC); .59 (NDCP)
Shujja et al. (2020)				
M	.81	.50 (PSDCO)	.86 (NDCO)	.50 (PSDCO)
W	.90	.41 (SCO)	.86 (NDCO)	.41 (SCO); .43 (PSDCO); .53 (DDCO)
Kanth et al. (2022)				
M	.87	.53 (PSDCO)	.82 (EDC)	.53 (PSDCO); .58 (PSDCP)
W	.87	.41 (PSDCO)	.86 (EDC)	.41 (PSDCO)

Note. M = Men; W = Women.
[a]No results found.

Authors such as Fallahchai et al. (2019), Kanth et al. (2022), Levesque et al. (2014), Randall et al. (2016), Shujja et al. (2020), and Wendołowska et al. (2020) present Alphas for

perceptions (Oneself and Partner), which were not mentioned in dimension Table 4. In addition to these perceptions, Rusu et al. (2016) add total reliability for CDC, and Martos et al. (2012) reported total reliability for the positive and negative subscales.

Ekimchik and Kryukova (2017), Fallahchai, et al. (2019), Kurt and Akbaş (2019), Levesque et al. (2014), and Martos et al. (2012) did not show reliability rates discriminating between men and women. Wendołowska et al. (2020) brought the gender discrimination (male and female), of this index. However, the Cronbach's Alpha value presented in Table 4 refers to the combination between genders, also present in their study.

Discussion

This systematic review examined the evidence of validity of the internal structure of the Dyadic Coping Inventory (DCI). The findings confirmed the multidimensionality of the instrument. However, there were additive modifications in the factors structure, such as variations, focus on the problem and focus on emotion in SDC and CDC.

It is worth mentioning that, despite the research by Donato et al. (2009) having appeared recurrently in the records analyzed, it was not considered relevant for the objective of this review. This is because it did not analyze the properties of DCI, but rather of their predecessor, the FDTC-N. Falconier et al. (2019) was also not considered because it refers to an adaptation and validation of the DIC for financial stress, the Dyadic Coping Inventory for Financial Stress (DCIFS).

Levesque et al. (2014), Xu et al. (2016), and Kurt and Akbaş (2019) did not include the EDC factor. To Xu et al. (2016), this factor does not present theoretical support. Finally, although literature points out ramifications in NDC (Hostile, Ambivalent and Superficial), none of the studies found them (Falconier & Kuhn, 2019).

In short, most of the presented studies showcased substantial variation in the number of items, mainly leveraged by the removal of items in the SCO and SCP factor. The following are exceptions: Gmelch et. al. (2008), Vedes et al. (2013), Martos et al. (2012), Kurt and Akbaş (2019), and Fallahchai et al. (2019).

Reliability is an important psychometric property, since it concerns how well the instrument is able to reproduce similar results over time and space, considering different participants (Terwee et al., 2007). There are several techniques for measuring reliability, e.g., test-retest, split half (split test) and internal consistency (Murphy & Davidshofer, 2005). Among the studies analyzed, only Kurt and Akbaş (2019) used split half and Gmelch et al. (2008) the test-retest. The other studies used the internal consistency indicator, expressed by the Cronbach's Alpha coefficient.

There is no consensus in literature on the Cronbach's Alpha coefficient. However, Hair et al. (2019) highlighted those alpha values between .60 and .70 are considered the lower acceptability limit. In this sense, the total reliability index of the instrument pointed out in the studies ranged from .81 (Shujja et al., 2020) to .95 (Randall et al.,

2016; Vedes et al., 2013). Although only Levesque et al. (2014), Xu et al. (2016), and Kurt and Akbaş (2019) have not reported full reliability since the creation of DCI by Bodenmann (2008), no study tested the existence of a global factor for Dyadic Coping. Therefore, although very prevalent in the studies presented here, the total reliability of the instrument seems to derive more from the sum and average reliability of the factor, which is empirically sustained.

Among the factors, the one that presented, with a higher regularity reliability, an index below α .60 is PSDC(O/P). This was verified in six studies (Falconier et al., 2013; Kanth et al., 2022; Randall et al., 2016; Rusu et al., 2016; Shujja et al., 2020; Xu et al., 2016).

Invariance measurements are related to evidence of validity (AERA, APA, & NCME, 2014). Of the fifteen studies, only seven presented invariance rates. This suggests a limitation of the studies. The indexes allow us to investigate how much the instrument seems to be adjusted to various orders of sample characteristics, e.g., genders, cultures, socio-educational levels. As for invariance measurements, the studies analyzed found at least partial scalar invariance among the tested groups (Falconier et al., 2013; Randall et al., 2016; Rusu et al., 2016; Shujja et al., 2020; Xu et al., 2016). In this respect, the research by Ledermann et al. (2010) which reached the level of configurational level between compared cultures.

Although the instrument undergoes modifications in its factorial structure and in the number of items, in general, it presents General Fit Index and factor weights that go from acceptable to very good. Based on the data of Invariance levels found, it makes it possible to allow adequate comparisons between genders and cultures. Finally, it is configured as an important tool to measure the quality of communication and the Dyadic Coping between gender and cultures.

By comparing groups, some studies made some mistakes in their analysis. Falconier et al. (2013) used a non-parametric test, Wilcoxon, to compare the means between men and women. This type of test is indicated to compare paired groups (Rey & Neuhäuser, 2011). Furthermore, the Measure of Central Tendency (MCT) in this case should be the Median. Thus, the authors should have opted for the Mann-Whitney test and the scores should have been indicated in ranks instead of means and standard deviations.

Other studies like Vedes et al. (2013) presents similar problems. Although the authors used the appropriate statistical test, the Mann-Whitney test for the non-normal unpaired samples, they used the mean as the MTC instead of using the Median.

Evidence of convergent, discriminant, concurrent or incremental validity was presented in all studies. However, these were not reported because they extrapolate the purpose of the review. To those interested in this information, see the studies in Table 1.

The International Test Comission (ITC, 2017) provides a set of guidelines for translating and adapting existing tests and for developing new tests. It highlights the differences between the terms of translation and adaptation of tests. The translation refers to a part of the process of adaptation that aims only at translating one language to another, that

is, it is limited to preserve the meaning of the language and not consider the educational or psychological equivalence of the test. The adaptation has a broader and more complex procedure because it considers qualitative and quantitative evidence to preserve the linguistic, psychological and cultural differences of the target population.

In this review, psychometric studies of an existing instrument, DCI, were identified. Some authors reported only the process of translation and back-translation of the Spanish, Italian, French, Romanian, Portuguese versions (Falconier et al., 2013; Ledermann et al., 2010; Levesque et al., 2014; Randall et al., 2016; Rusu et al., 2016; Vedes et al., 2013). Fallahchai et al. (2019), the Persian version, includes a pilot study with qualified experts. Ekimchik and Kryukova (2017) and Kurt and Akbaş (2019), the Russian and Turkish versions respectively, include a pilot study with target population. Xu et al. (2016), the Chinese version, used recommendations only for translation procedures. Shujja et al. (2020), Wendołowska et al. (2020), and Kanth et al. (2022), the Urdu, Polish and Tamil versions, followed different guidelines to describe the translation and adaptation procedures. The Hungarian version did not mention the translation and adaptation procedures (Martos et al., 2012).

Although guidelines for test translation and adaptation have been available for approximately 20 years, it can still be observed in the literature that most test adaptations did not follow the guidelines. The ITC encourages the use of the guidelines as a primary source for disseminating best practices in research (ITC, 2017). Most studies carried out different reports of the instrument's translation and adaptation procedures. This, perhaps, may compromise the analyses, inferences and results of the items, as well as the presentation of qualitative and quantitative evidence of the cross-cultural adaptation of the DIC. Future research could adopt a guide to reporting these procedures to favor replicability and promote evidence from cross-cultural research.

In this revision, the original German version of the DCI (Bodenmann, 2008) has been translated and adapted into 14 languages. The findings partially corroborate the number of languages in validation studies mentioned by Xu et al. (2016) and Shujja et al. (2020), German, Italian, French, Portuguese-Portugal, Romanian, Persian, English, Polish and Chinese versions, and five studies on the psychometric properties by Fallahchai et al. (2019), French, Portuguese-Portugal, English, Romanian and Chinese versions. Based on these data, it is suggested that research be carried out in other countries, including Brazil, to verify the psychometric properties of the DCI in different cultural contexts.

The Japanese DCI version by Yokotani and Kurosawa (2015) has been cited in other studies (Kanth et al., 2022; Shujja et al., 2020; Wendołowska et al., 2020). However, it was not considered in this review because it did not analyze the DCI psychometric properties. For Kanth et al. (2022), the DCI was translated to 24 languages, but they did not mention which ones.

The results of the fifteen studies that examined the DCI psychometric properties were across the American, European and Asian continents, Western and Eastern cultures. The

difference between these cultures reveal specificities in the structure and dynamics of marital relationships (Kanth et al., 2022), which reflects differences in score between genders (Table 3). For example, in Pakistan, due to the practices of arranged, endogamous and exchange marriages and patriarchal society, women perceive their husbands as less oriented to share experience of stress with them and to incorporate assignments from their wives into their tasks (Shujja et al., 2020). In Polish, the family model is considered traditional and patriarchal (Wendołowska et al., 2020). So, women tend to seek help from their partners and assume the role of emotional support and care for the families, while men seek to help them, taking on their tasks and providing financial support to the family more regularly. This type of context is also seen in Latino families, as seen in Falconier et al. (2013) and in the Russian context (Ekimchik & Kryukova, 2017). In Chinese culture, the marital relationship is based on the culture of Confucianism and collectivism, which may explain the differences between the genders only in SC (Xu et al., 2016)

It should be noted that, despite data searches on Capes' *Portal de Periódicos* and on Google Scholar search engine were made without refinement in the results, most of the studies were peer-reviewed. This suggests the possibility that non-peer-reviewed publications might have been disregarded in the review. On the other hand, peer-reviewed journals minimize biases and favor good quality of productions.

This review is considered original and unprecedented, as it compared the results of the DCI psychometric properties throughout its adaptation studies. The 15 studies presented two factorial structures and variation in the number of final items, either through PCA, EFA or CFA. The SC is fundamental in the analyses of DC behaviors. As additional strengths of this study, the following stand out: 1) presentation in Lingua Franca of studies in German, Hungarian, Russian and Turkish allowing for a greater reach of information; 2) the adoption of the terms factors, to refer to dimensions or subscales, and scales to refer to aggregated scales, perceptions or perspectives. This measure aimed to standardize the presentation of findings and reduce noise in understanding; 3) pointing out inaccuracies in the reports and in the methodological choices in the studies. During the selection of studies, a book was found that brings together various researches by the DCI in different cultures, for example, the psychometric properties in the Greek context. Due to the review eligibility criteria, only peer-reviewed journals and validity evidence based on the internal structure were included. It is recommended that subsequent similar reviews include other sources in their literature research. It's also recommended that they check other evidence of validity based on external variables for a better range of results.

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